T-1 Steel Proved at Brownlee 64

Savings From the Scrap Pile 70

Inspector Meetings 77

There Were 10,000 Visitors 86

ELECTRICAL WEST

November 1958
50 Cents

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

Push-Button Precipitation 68

Human Relations in Business . . . 63

A Power Line Without Poles 66

"Electricity Is the Spark" 81

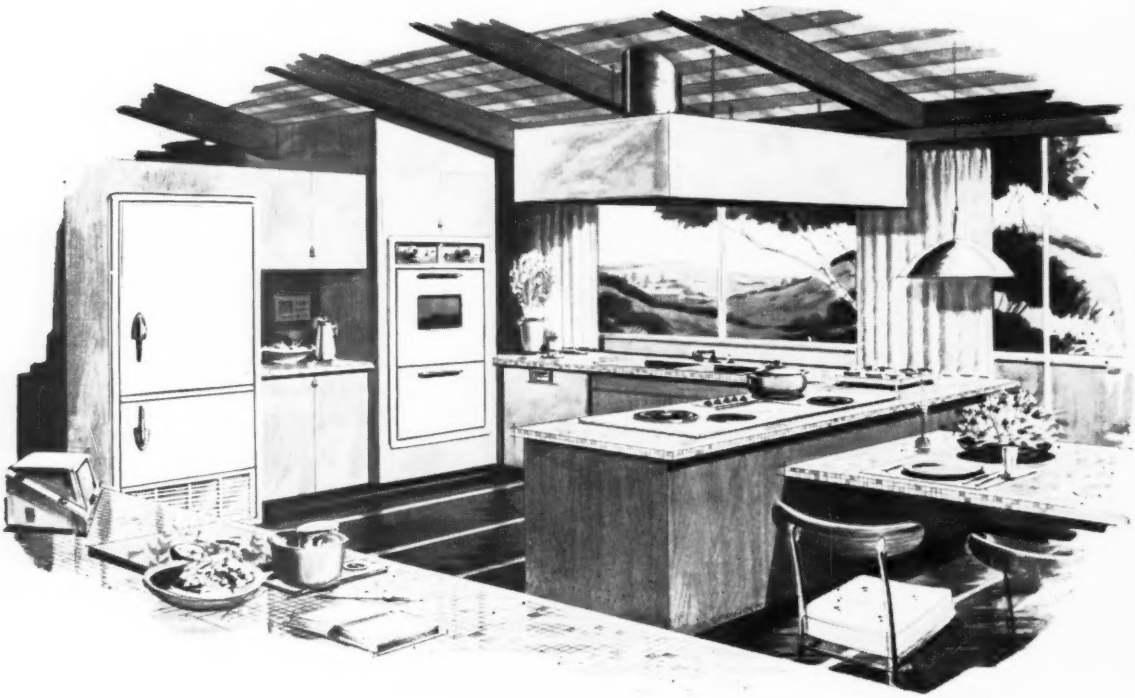
UL Labels Foreign Products 61

New-home buyer: This...

not this... PRICE

MEDALLION HOME
LIVE BETTER ELECTRICALLY

is your guide to **Luxury Electric Living**



It's a startling fact: Two out of three homes being built —in all price ranges—are already *electrically obsolete.*

But there is one guarantee that a new home will offer the convenience of modern electric living—that it will *stay* up-to-date electrically. That guarantee is the Medallion Home Award.

Before you buy, always look for the Medallion emblem, awarded only to *extra-value* homes (and apartments) which meet *all these standards* of the nation-wide Medallion Home program for better housing:

Major appliances, including an all-electric kitchen. already installed *and included in the purchase price.*

Proper lighting provided for in work, play and traffic areas—illumination for beauty as well as for your family's safety and comfort.

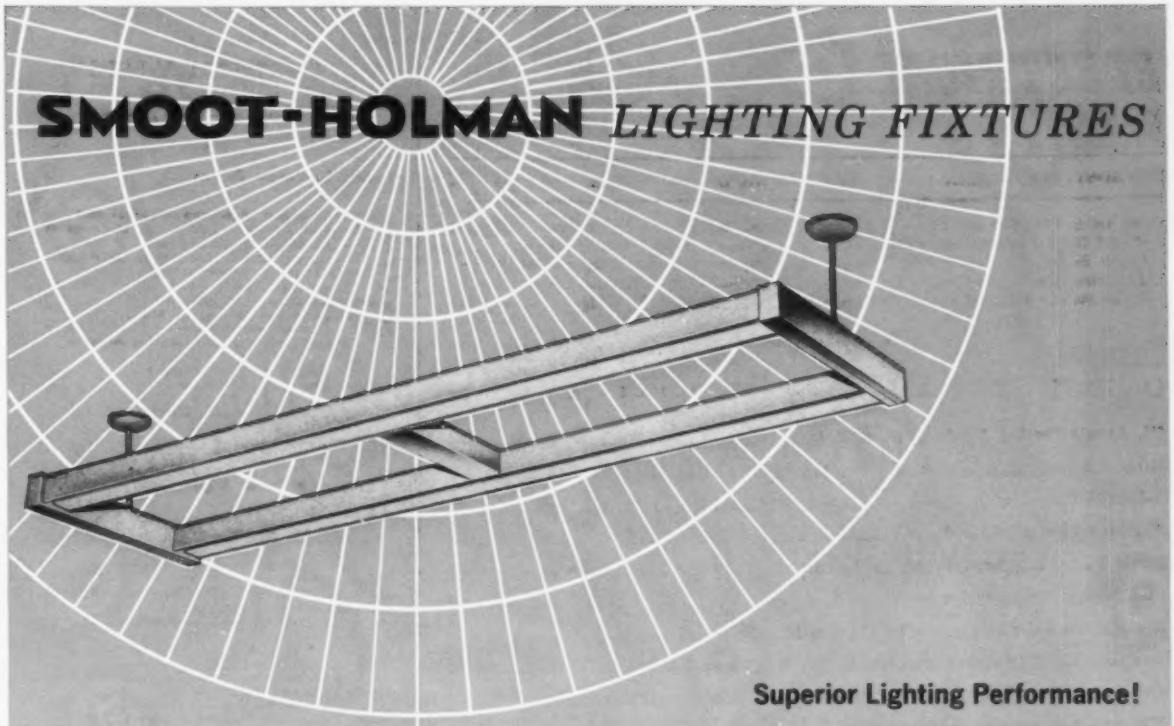
Full Housepower wiring—ample for all your present appliances *and* the many you will want tomorrow.

High resale value, because Medallion Homes *stay modern.*

When you are shopping for a new home, ask first of all, "Is it a Medallion Home?"

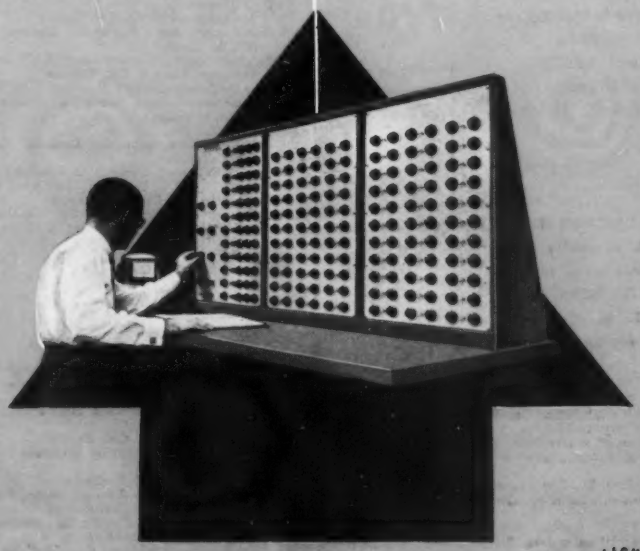
SOUTHERN CALIFORNIA Edison COMPANY *helps you* LIVE BETTER—ELECTRICALLY

SMOOT-HOLMAN *LIGHTING FIXTURES*



Superior Lighting Performance!
Scientific Lighting Design!

MADE POSSIBLE BY THE NEW SMOOT-HOLMAN ANALOGUE COMPUTER!



Through the use of an advance design, analogue computer, Smoot-Holman research engineers are now able to design fixtures that give superior performance and are the ultimate in construction and efficiency. This new computer, the first of its type ever built for commercial use, solves problems of fixture design, as well as many other problems in the field of lighting. It's operation is based on the formation of an electrical network analogue of the distribution of light flux. Here is another example of Smoot-Holman's research and development to bring you *"Tomorrow's Lighting Today."*

SMOOT-HOLMAN COMPANY
Inglewood • California

TOMORROW'S LIGHTING TODAY!

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S. Established 1887

C. W. Leihy, Publisher and Editor
W. A. Cyr, Consulting Editor
Peggy Boyer, Associate Editor
Jack Robinson, Engineering Editor
Miriam Stuart, Editorial Assistant

George C. Tenney, President
Dale VanHorn, News Editor
Marvin Petal, Pacific Southwest Region
Frank Pitman, Intermountain Region
Ray Bloomberg, Pacific Northwest Region

CONTENTS

VOL. 121, NO. 5 NOVEMBER 1958

UL Labels Foreign Products by Karl Geiges 61
Human Relations in Business by Dr. Joseph G. Phelan 63
T-1 Steel Proved at Brownlee by Fred R. McCormick 64
A Power Line Without Poles 66
Steam Plant Efficiency by M. D. Liechty 67
Push-Button Precipitation by W. A. Lang 68
Savings From the Scrap Pile by Clayton M. Allen 70
Beat the Tree Trimming Problem by W. H. Howe 72
Grounding Transformers—V by Tom Hughes 73
NW and SW Inspector Meetings 77
"Electricity Is the Spark" 81
San Diego Readies for Another Boom 82
Range Drive Starts New Plan 85

DEPARTMENTS

Bulletins 28
Construction News 75
Editorials 58
Electra's Husband 56
How're We Doing? 7
Letters to the Editor 117
New Products 19
News 90
News Roundup 10
Advertising Index 116

ADVERTISING REPRESENTATIVES

ATLANTA 3: Robert Powell, Rhodes Haverty Bldg.; CHICAGO 11: W. C. McMurray Jr., 520 N. Michigan Ave.; CLEVELAND 13: Frank Seiler, R. A. Hubley, 1164 Illuminating Bldg., 55 Public Square; DENVER 2: John Patten, 1740 Broadway, AL 5-2981; LOS ANGELES 17: Russ Antles, 1125 W. Sixth St., HU 2-5450; NEW YORK 36: Dick Thompson, 500 Fifth Ave.; SAN FRANCISCO 4: Dick Alcorn, T. H. Carmody, Advertising Sales Manager, Bernice Johnston, Advertising Production Manager, 68 Post St., DO 2-4600.

Offices: Boston, Dallas, Detroit, Philadelphia, Pittsburgh, St. Louis

Electrical West (with which is consolidated The Journal of Electricity). November 1958, Vol. 121, No. 5. Published semimonthly except November when published trimonthly by McGraw-Hill Company of California, James H. McGraw (1860-1948) Founder. Office of publication, 235 N.W. Park Ave., Portland 9, Ore. See panel below for directions regarding subscriptions or change of address.

Executive, editorial, circulation and advertising offices: 68 Post St., San Francisco 4, Calif. Donald C. McGraw, chairman of the board; George C. Tenney, president; John W. Otterson, vice-president; B. M. Boccoli, secretary and treasurer.

Position and company connection must be indicated on subscription orders. Send to address shown in panel below. Subscription price includes the regular monthly issue, the news letter issue and the November directory issue. United States subscription rate $2 a year, single copies 50c (November directory issue $1). Latin American Republics $2 a year; Canada $2.50 a year; all other countries $4 a year. Entered as second class matter, Dec. 17, 1956, at the post office at Portland, Ore., under the act of March 3, 1879. Printed in U. S. A. Title registered in U. S. Patent Office.

© Copyright 1958, McGraw-Hill Company of California.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, Electrical West, 68 Post St., San Francisco 4, Calif. Allow 30 days for change of address.

Postmaster: please send notice 3579 to Electrical West, 68 Post St., San Francisco 4, Calif.

ELECTRICAL WEST'S
Editorial Advisory Board

Pacific Southwest Region

J. F. Davenport, Executive Vice-President
Southern California Edison Co., Los Angeles
R. H. Cockfield, Business Agent
Department of Water & Power, Los Angeles
Joseph Pengilly, Vice-President
Square D Co., Los Angeles
Leonard Hobbs, Vice-President
Smoot-Holman Co., Inglewood
Harry Gerster, Vice-President
General Electric Supply Co., Los Angeles
Sidney Hill
Hill Electric Co., Los Angeles
C. M. Smith, Sales Manager
Fluor Corp., Los Angeles
Victor Hartley, Managing Director
PCEA, Los Angeles

Northern California Region

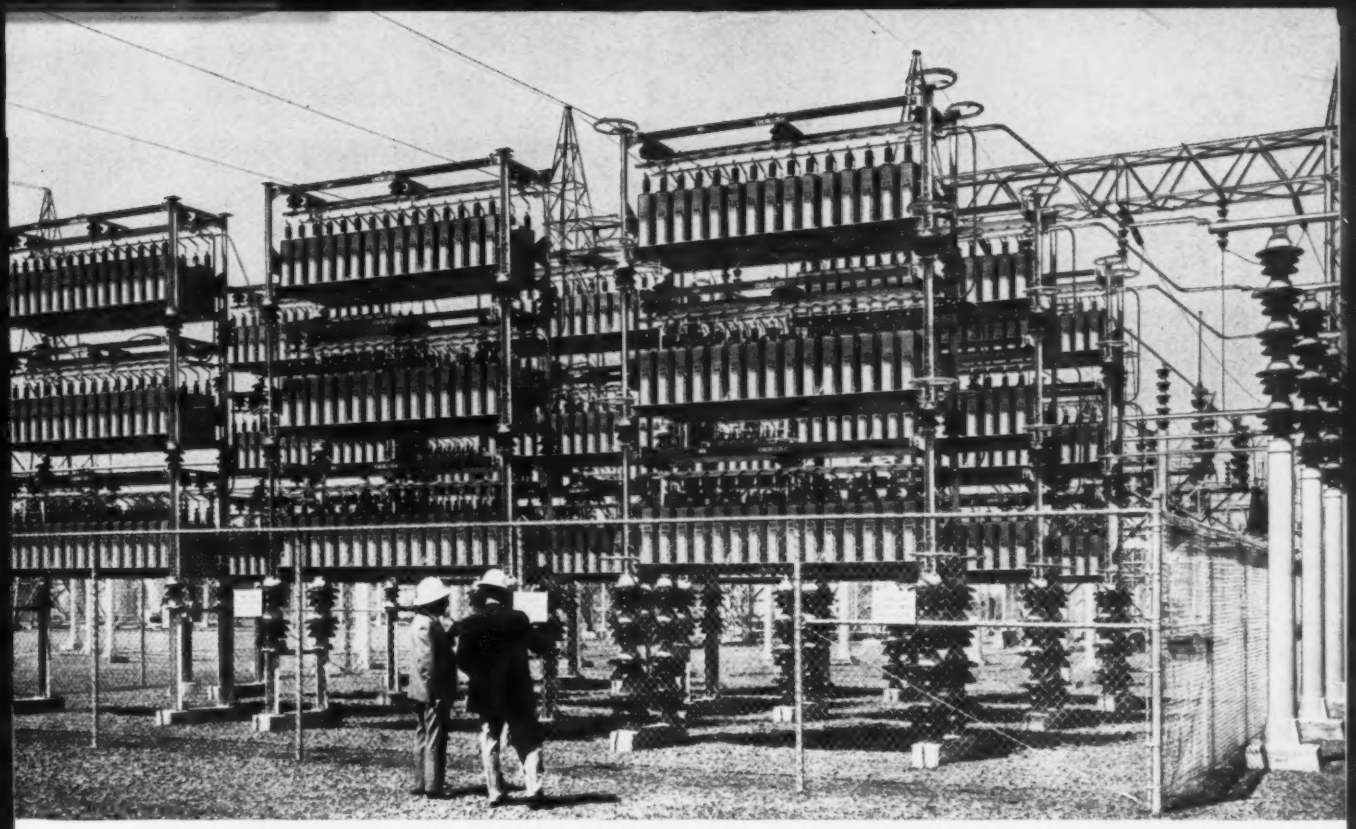
Walter Maytham, Vice-President
Westinghouse Electric Corp., San Francisco
Norman R. Sutherland, President
Pacific Gas & Electric Co., San Francisco
Fred Nicholas
F. M. Nicholas Co., San Francisco
Alfred H. Meyer, President
Leo J. Meyberg Co., San Francisco
Arthur Dahl, Sales Manager
General Electric Supply Co., San Francisco
Paul Churchill, Regional Manager
Line Material Industries, South San Francisco
George Abbett, President
Abbett Electric Co., San Francisco
Karl Bausch, Chief Electrical Engineer
Bechtel Corp., San Francisco
Walter Bayha
Bayha, Weir & Finato, San Francisco

Intermountain Region

R. D. Moody, Manager
Allis-Chalmers Mfg. Co., Denver
David B. Hyer Jr., President
Southern Colorado Power Co., Pueblo
D. E. Provost
Stearns-Roger Mfg. Co., Denver
Don Larson, Mgr., Rocky Mt. Chapter
NECA, Denver
Ralph Johnson, Vice-President & General Manager
Sturgeon Electric Co., Denver
Ken G. Eaton, District Manager
Anaconda Wire & Cable Co., Denver
Howard Peterson
Peterson Co., Denver
Ralph Hubbard, Managing Director
RMEL, Denver
W. W. Bowman, Director of Publicity
Utah Power & Light Co., Salt Lake City
A. E. Fleming, District Manager
General Electric Supply Co., Denver
John Kimball, Vice-President & General Manager
Idaho Power Co., Boise

Pacific Northwest Region

Eric Nelson
Shaffer & Nelson, Seattle
Charles C. Cutter, Northwest Representative
Federal Pacific Electric Co., Seattle
Ralph James
Northwestern Agencies, Seattle
R. B. Lane, President
Industrial Electric Co., Seattle
Beverly Travis, Consulting Engineer
Seattle
Eugene Starr, Chief Engineer
Bonneville Power Administration, Portland
Thomas W. Delzell, Chairman of Board
Portland General Electric Co., Portland
D. R. McClung, President
Pacific Power & Light Co., Portland
James F. Grieve, Vice-President
C. C. Moore, Engineers, Portland
Max Wood
Schwager-Wood Co., Portland
R. H. Sroufe, Executive Vice-President
Stubbs Electric Co., Portland
Alden F. Krieg, Managing Director
NELPA, Portland
Jack D. Stevens
Puget Sound Utilities Council, Seattle



L-M ENGINEERS design many large capacitor banks, such as this 40,500 kvar, 230 kv switched bank, said to be the highest voltage shunt capacitor bank in the country. It is made up of L-M factory-assembled and wired blocks of 50 kvar Elemex capacitors, such as the one shown below.

L-M Designs Capacitor Installations From 240 Volts To This 230 kv Bank

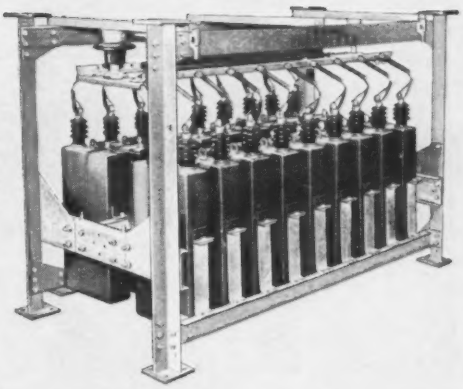
The bank shown above (location on request) consists of twenty-seven 1500-kvar split-bus capacitor blocks. Each block contains thirty 50-kvar 7200-volt single-bushing Elemex capacitors; each individually fused, in two series groups.

Each phase contains eighteen series groups in nine blocks for a voltage of 129,600 per phase to neutral.

Since the neutral is solidly grounded, graded base insulation is used—196 kv porcelain under the incoming line stack; 69 kv under the middle stack; and 15 kv under the third stack. Notice also the corona rings on all blocks of the incoming line stacks at the right.

Let L-M Engineer YOUR Banks

Call on the L-M Field Engineer for anything from a 3 kvar secondary capacitor to the largest bank. He can provide literature, and tell you how to get L-M application engineering service. Or write Line Material Industries, Milwaukee 1, Wisconsin.



TYPICAL L-M BLOCK OF Elemex capacitors. Block is assembled and wired at the factory, ready to install. L-M was the first with 50 kvar capacitors and a leader in the engineering of pre-wired blocks and pole-type racks, which can be supplied with or without oil switches mounted on the rack.

364

LINE MATERIAL Industries *Elemex® Capacitors*

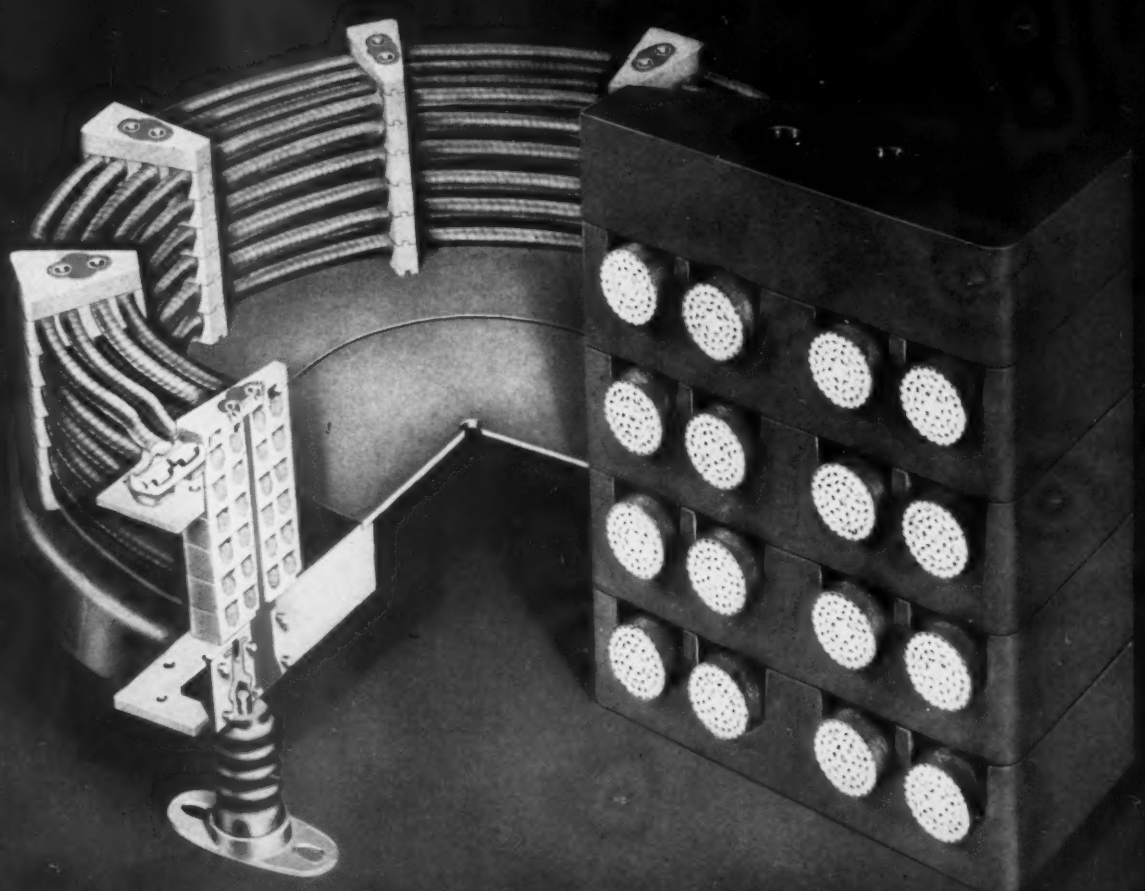
McGRAW-EDISON COMPANY

DISTRIBUTION TRANSFORMERS • KYLE RECLOSERS AND OIL SWITCHES • FUSE CUTOUTS AND FUSE LINKS • LIGHTNING ARRESTERS
POWER SWITCHING EQUIPMENT • PACKAGED SUBSTATIONS • CAPACITORS • REGULATORS • OUTDOOR LIGHTING
LINE CONSTRUCTION MATERIALS • PORCELAIN INSULATORS • FIBRE PIPE AND CONDUIT

McGRAW EDISON

"Blue Sky" goes practical . . . with new materials
developed through plowback of earnings
into pure research . . .

WESTINGHOUSE CL REACTOR GAINS



EXTRA STRENGTH, LONGER LIFE ... SIZE AND WEIGHT CUT 30%

Earnings reinvested in pure research have produced new "miracle" materials that are virtually ageless. Westinghouse has applied these "blue sky" developments to the construction of its line of current-limiting reactors. The new construction practically eliminates aging and maintenance problems, provides extra mechanical and dielectric strength, reduces size and weight.

One new material, a glass-reinforced polyester compound, with three times the compressive strength and ten times the tensile strength of concrete, is molded into cable-holding cleats. Its resiliency enables reactors to withstand severe short-circuit stresses, permits expansion of conductors during overloads.

Another new material, a special reinforced resin, bonds the cleats together, providing greater column strength, resistance to stresses between units and closer spacing, without braces.

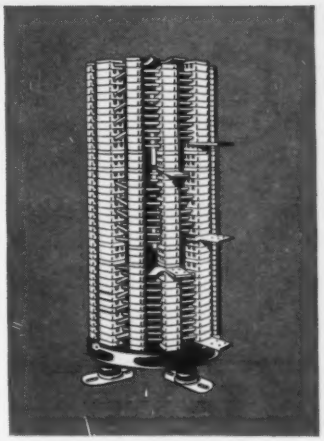
Unlike concrete, the polyester-glass is impervious to moisture and atmospheric conditions, will not age or deteriorate under normal operating conditions . . . this gives the Westinghouse CL reactor unequaled durability, with almost no maintenance.

Lightweight aluminum cable now becomes practical. This, together with the lighter, smaller cleats, reduces the reactors' overall size and weight by 30%.

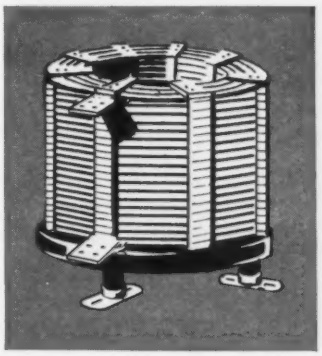
Call your Westinghouse representative for the full story of these exceptional reactors — in all ratings for indoor and outdoor service . . . Or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70868

YOU CAN BE SURE... IF IT'S

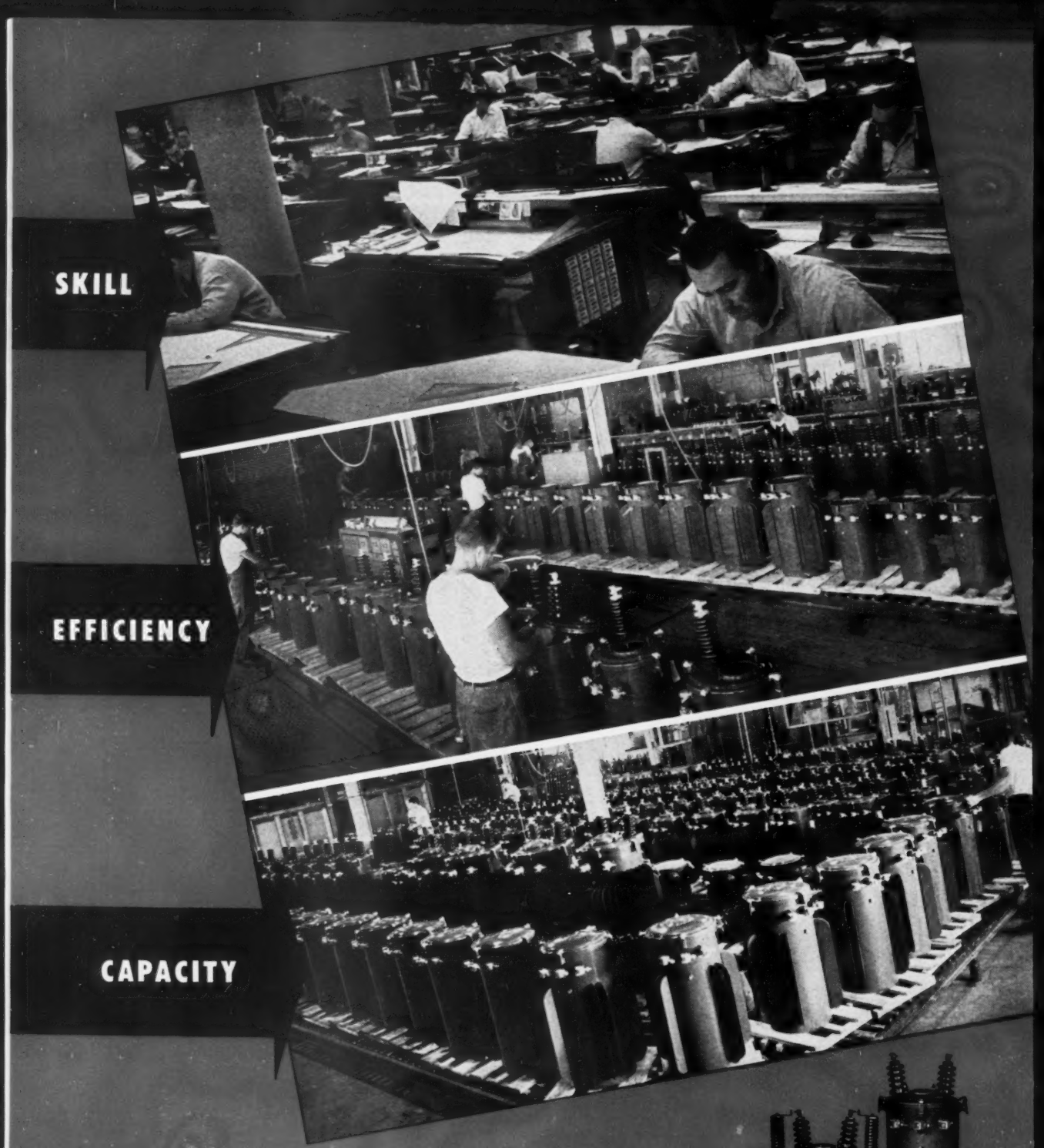
Westinghouse



Three-phase integral reactor (above) and single-phase reactor (below) are both constructed with the super-durable, non-aging materials developed through pure research by Westinghouse.



Cross-section of Westinghouse single-phase CL reactor, with close-up view of glass-reinforced polyester molded cleats.



Provide Moloney Distribution Transformers in the Quantities You Require

Modern, highly mechanized production methods give Moloney the ability to provide any quantity of transformers needed to fulfill your requirements.

These efficient production methods, together with skillful design and adequate quality control procedures, guarantee that Moloney Transformers will be of the highest quality.

Specify the transformers that are designed, built and tested for efficient, dependable performance under all operating conditions . . . Specify Moloney Transformers . . . All Along the Line.

ME 50-28

MOLONEY ELECTRIC COMPANY

Manufacturers of Transformers for Utilities, Industry, and Electronic Applications

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO., AND TORONTO, ONT., CANADA

Construction Highlights

Expansion program, California Institute of Technology, Pasadena, Calif.: student housing, $3,750,000; library, $2,400,000; remodeling existing buildings, $1,900,000.

Office building, 22-story, Los Angeles, Calif., $10,000,000.

Bank addition, Denver, Colo., $3,000,000.

Capehart housing, 800 units, Lemoore, Calif., $12,400,000; 550 units, Whidbey Island, Wash., $8,525,000; 400 units, Beale Air Force Base, Calif., $6,600,000; 100 units, Lompoc, Calif., $1,650,000; 460 units, Glasgow, Mont., $7,590,000; 200 units, Las Cruces, N. M., $3,300,000; 200 units, Colorado Springs, Colo., $3,300,000; 480 units, Honolulu, T. H., $7,900,000.

Retirement home, Spokane, Wash., $2,750,000.

Physical education building, Eastern Montana College of Education, Billings, Mont., $1,100,000.

State office building, Fresno, Calif., $3,000,000.

Jail, courthouse and juvenile home, Reno, Nev., $2,200,000.

Eight buildings, Providence Heights College, Issaquah, Wash., $4,000,000.

School additions and new construction in California: Riverside, $1,500,000; Santa Monica, $1,000,000; Garden Grove, $3,500,000; Covina, $1,200,000; Lancaster, $3,900,000; Los Gatos, $1,650,000; Torrance, $1,330,000; Los Angeles, $4,525,000. Washington: Sunnyside, $1,400,000; Seattle, $4,300,000; Pasco, $1,000,000.

Technical facilities, Luke Air Force Base, Phoenix, Ariz., $7,800,000.

Research laboratory and other facilities, Los Alamos, N. M., $2,500,000.

Plant, storage, tester and other atomic facilities, Livermore, Calif., $2,640,000.

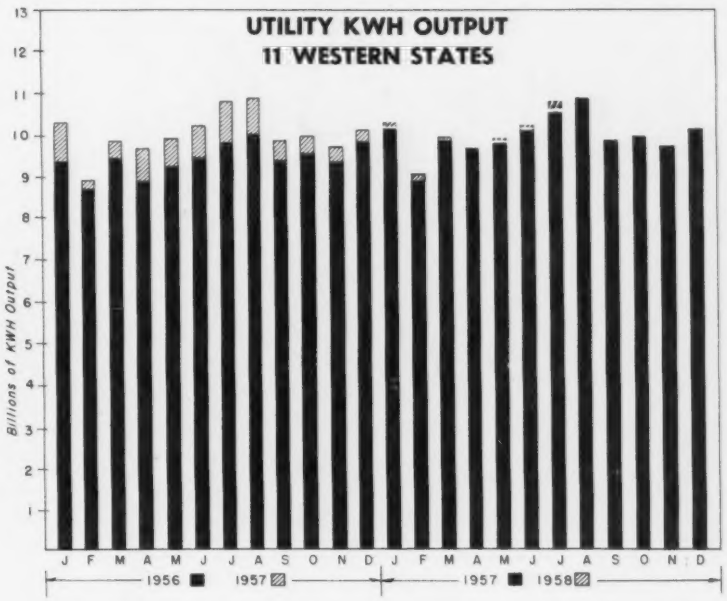
Reactor facilities, Sandia Laboratory, Albuquerque, N. M., $2,000,000.

Production reactor facilities, Hanford Works, Richland, Wash., $145,000,000; other facilities, $3,575,000.

Transmission improvements, Riverton Valley Electric Assn., Riverton, Wyo., $938,000; at Jemez Mountain Electric Co-op, Espanola, N. M., $788,000.

Motel, 200 units, Albuquerque, N. M., $1,200,000.

----How're We Doing?



Output Comparisons

Year-to-year Kwh Output Changes in Western Regions and U. S.
Per Cent Changes Over Same Week One Year Ago

Week Ending	Rocky Mountain	Pacific Southwest	Pacific Northwest	U. S. Total
Sept. 6	+9.8	+5.3	−4.9	+3.0
Sept. 13	+9.0	+1.2	−4.1	+2.5
Sept. 20	+5.6	+5.6	−3.2	+2.1
Sept. 27	+6.2	+1.7	+0.9	+5.5

New High in Utility Borrowing

An analysis of public utility financing compiled by Ebasco Services Inc. reveals that privately owned utility financings exceeded $4,000,000,000 in the first nine months of 1958. This is a new high for the period, and 5% greater than the total for the corresponding months last year. Privately owned electric utilities accounted for $2,000,000,000 of the first nine months' borrowings. This is slightly less than in 1957.

Appliance Stocks Offered

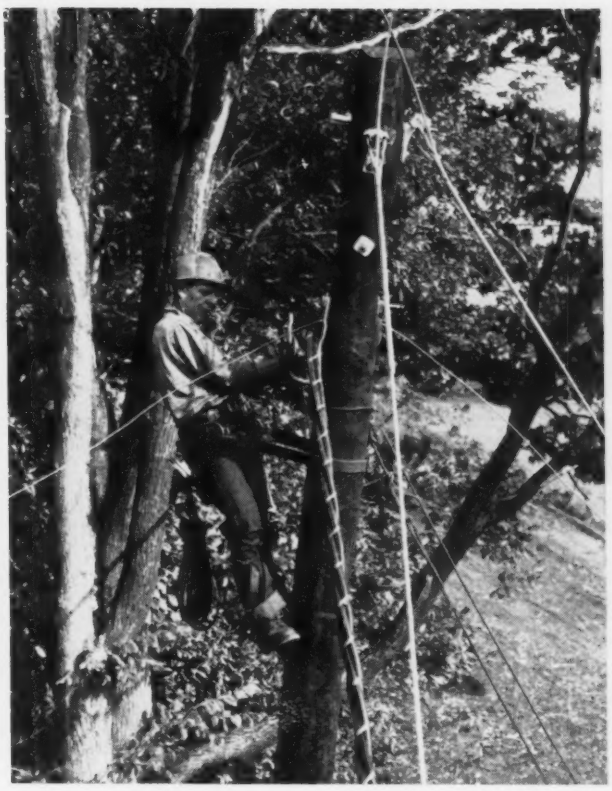
Two appliance manufacturing company stocks are being offered. Whirlpool Corp. will have paid an estimated $1.35 a share this year, with the potential of doubling this in the near future and strong possibilities of continuing gains in the years to follow. Maytag Co. has never earned less than $3.50 a share and in the first half of 1958 (one of the most difficult periods the industry has experienced) the company reported earnings of $1.93 a share, which is up 19% from the same period 1957.

Additional crossarm hardware, or, in some cases crossarms themselves, are not necessary when using aerial cable.

◆ In densely wooded areas, the most efficient and reliable method of power distribution is the "aerial cable route."

A line running from the cable trailer to the truck winch pulls the aerial cable over temporary pulleys mounted on the poles.

Both initial and periodic tree trimming are cut to an absolute minimum with Rome's preassembled aerial cable.



Fast, efficient installations, even in densely wooded areas, are possible with Rome's preassembled aerial cable.

Trim your tree-trimming costs with Rome's preassembled aerial cable

Stringing power lines, especially through wooded areas, need not be a time-consuming, expensive installation. Not if you use Rome's preassembled aerial cable.

Because of the staunch characteristics of preassembled aerial cable, both initial and periodical tree-trimming time is cut way down. Initially, you need not clear as much of a right of way for preassembled aerial cable as is necessary in the case of open-wire construction. Periodic tree trimming can be put off for as long as five years, in some cases. This is compared to a normal two-year requirement for open-wire construction.

In residential areas, tree trimming can be a problem. Home owners, who have an inherent interest in the trimming of trees which grace their property, are very interested in the amount of trimming that is necessary. When using Rome's preassembled aerial cable, it is not necessary to disturb the trees as much as in the case of open-wire installations.

In addition to the tree-trimming advantages of Rome's preassembled aerial cable, there are many other "reliability" factors which you get by specifying this particular type of cable installation.

Improved Voltage Regulation

Aerial cable, because of its close geometric spacing as compared with open-wire circuits, has a lower reactance. Voltage drop is about half as great as typical crossarm construction. Similarly, for a given allowable voltage drop, power can be transmitted twice as far.

Storm Protection

You can reduce your storm maintenance costs due to the strength of preassembled aerial cable. Falling branches, or even trees, can be supported by the cable itself.

Other features of Rome's preassembled aerial cable include (a) practicality of mid-span tapping (because of reverse-lay construction); (b) improved appearance (elimination of pole crossarm hardware, in many cases); and (c) simplicity of installation.

Use Rome's preassembled aerial cable the next time you have to extend your power distribution lines. Your job will be easier and you'll save labor and maintenance expense. For more information on this product, call your nearest Rome Cable representative—or write to Department 770, Rome Cable Corporation, Rome, New York.

ROME CABLE

CORPORATION

EW news roundup

DECEPTION – Politicians claim that the defense requirements are responsible for the mounting federal deficit. Don't be fooled because military spending has only increased 10% since 1955 while nondefense programs have increased $10 billion or more than 50%.

Typical of the welfare state attitude of Congress is an increase in labor and welfare of $1.8 billion, agriculture $1.9 billion and general government $400 billion.

It might be better to reverse the procedure and give the military the $10 billion increase and keep the $5 billion increase in military spending for domestic purposes.

—EW—

From the Newsletter of Seattle City Light comes this little gem. "Cheerful people, doctors say, resist disease better than glum ones. In other words, the surly bird catches the germ."

—EW—

NEW DESIGN – The world's first power transformer cooled and insulated by a vapor and gas combination has been placed in service by an eastern utility. Built by Westinghouse, this 7,500-kva unit is cooled by a fluorocarbon liquid which is pumped through the core and coils of the transformer. On contact with the warm metals, the liquid vaporizes, absorbing the heat of vaporization in the process and the gases thus produced enter a cooling system, are condensed back into the liquid for further recirculation. The insulating medium is nontoxic, explosionproof and fireproof, eliminating the need for expensive fireproofing and fire-extinguishing systems.

—EW—

TRAVELERS – A group of American electric industry executives in Russia touring power plants is made up of Walker L. Cisler, president of Detroit Edison Co.; Gwilym A. Price, chairman of Westinghouse Electric Corp.; Phillip D. Reed, finance committee chairman of General Electric Co.; and Edwin Vennard, vice-president and managing director of Edison Electric Institute. EEI is sponsoring the trip. Soviet power leaders are expected to visit the United States later.

A stockroom idea in use at Lockheed Missile Systems Division of Lockheed Aircraft Corp., Sunnyvale, Calif., is a good idea that electrical contractors might find useful. The display board has one each of every item in stock. An electrician can choose whatever part he needs without remembering the proper number or name. Pictured are electrician Frank Kiewe and the crib operator, Paul Levy

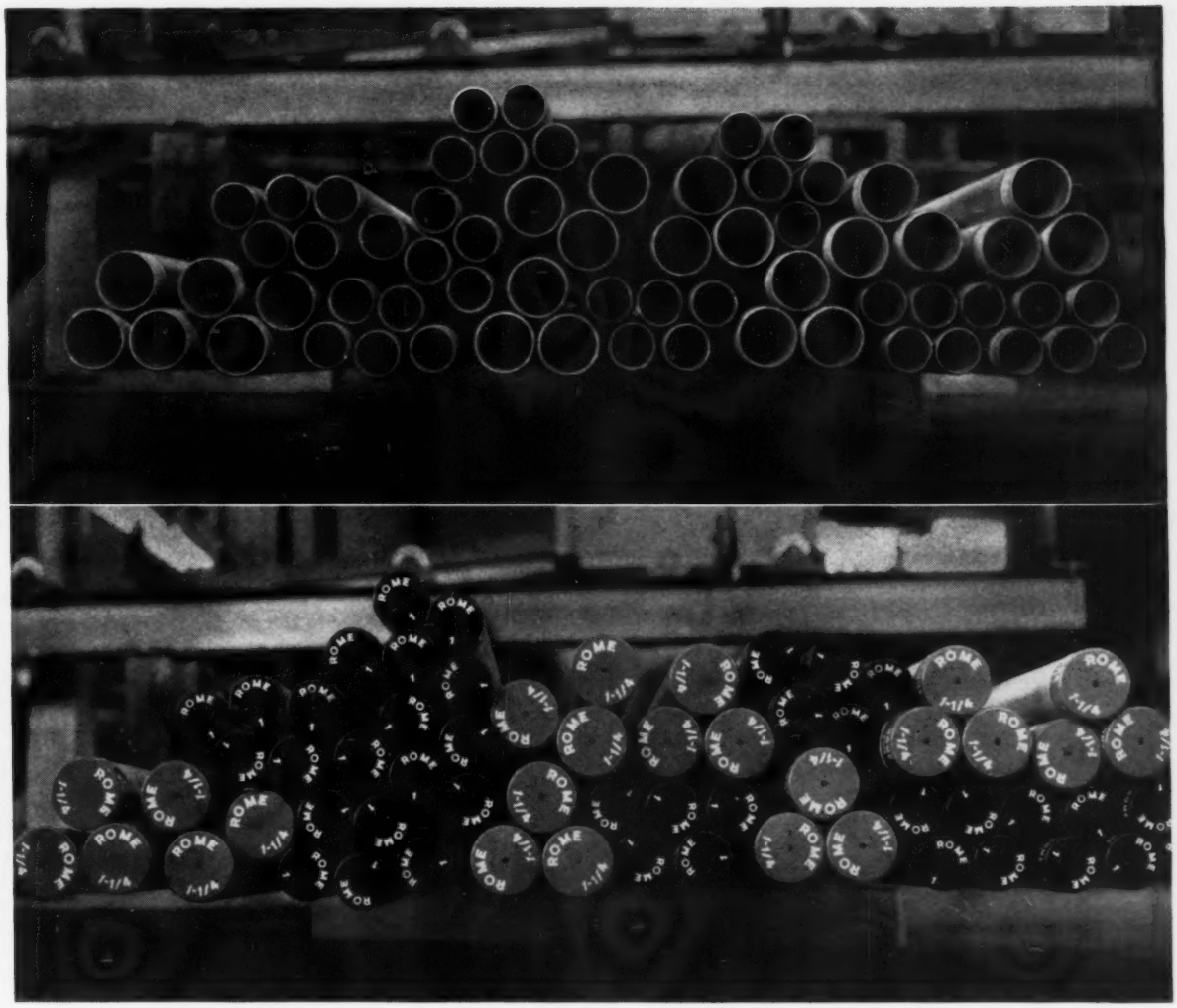
—EW—

MIDGET—"Not for power, not for floods, just for kids," is the label that will go on Oregon's newest and smallest dam. Portland General Electric Co. built the Small Fry Dam on a tributary creek that runs through a PGE recreational area to the reservoir of its North Fork project.

The tiny dam will form a one-acre fishing lake just for youngsters.

Incidentally, the name of the dam really is "Small Fry."

NEW BOOKLETS—The U.S. Chamber of Commerce has a new publication "Better Business Relations Through Employee Meetings" (available for 50¢ per copy), which demonstrates the value of good communications with employees. The 24-page, illustrated booklet tells how to plan successful employee meetings and suggests follow-through methods. Also included are suggestions for discussion leaders and methods of using display material to the best advantage. . . EEI has made available an interim survey on the "Status and Prospects of Nuclear Power" ($1 per copy to member companies and employees), which is a very comprehensive, but concise, appraisal of the present nuclear power situation and the future prospects of economic energy from nuclear fuels. . . The 1958 edition of "I Want to Know About the Electric



• Blue . . . 1", 2", 3", 4", 5", 6" • Black . . . ½", 1½", 2½", 3½" • Red . . . ¾", 1¼".

Which conduit stack would you prefer for easy size identification?

There's no need for your crews to spend a lot of time searching through stacks of rigid conduit for a particular size. Now they can see the size they need *from thirty feet away.*

With Rome's rigid conduit you can cut on-job costs by eliminating waste motion. This conduit is equipped with unique steel thread protectors that are color-coded and lithographed with the conduit size for easy and immediate identification.

Rome's rigid conduit with color-coded, size-imprinted thread protectors also saves you money by:

Eliminating capping time

Your crews need not search for seals or bushings to protect your conduit from concrete, dirt or stones. You simply bend a stub-up with Rome's color-coded thread protector in place and then leave it.

Positive thread protection

Rome's color-coded thread protectors are made of *steel* to prevent damage to the threads. They fit firmly on the conduit, yet are easily removed without damaging either the threads or the protector itself. You can use them over and over again.

Make your work easier—and save money, too. Use Rome's rigid conduit for your next job. Call your Rome Cable distributor for more information—or write to Department 948, Rome Cable Corporation, Torrance, Calif.

ROME CABLE
CORPORATION

Jobs go smoother, cost less when you standardize on

TOOLS FOR CRAFTSMEN
GREENLEE

HIGH-QUALITY TOOLS

NEW UTILITY CHISEL NO. 437

Made specially for cutting daps in line poles. Blade is 2" wide, heat-treated full length for maximum service. Tough plastic handle positively fastened to the tang—steel capped for long service—extra length for secure, comfortable grip.

SMOOTH BORING POWER AND BRACE BITS
Wide choice of bits for smooth boring, long life on every type of job. See your distributor or write for catalog.

GREENLEE TOOL CO.
1771 Columbia Avenue, Rockford, Illinois

Industry" is also available from EEI and contains the answers to 29 questions most frequently asked by people inquiring about the electric power industry. . . The Committee for Economic Development has produced a booklet "The Defense We Can Afford," edited by James F. Brownlee, a New York investment banker and chairman of the CED subcommittee on economic policies of national security. It discusses such matters as the various military and economic threats to our security which we face at home and abroad and it shows several ways of meeting the problem that are within the means of an essentially healthy American economy.

—EW—

Starting salaries for current engineering graduates are running about $475 to $500 per month, compared to $380 to $400 for nontechnical graduates, according to a survey of colleges and universities by the Northwestern National Life Insurance Co. Starting salaries are, in general, up 3% to 5% over last year. While the survey indicates that over-all recruiting has slacked off, engineering graduates are still in a highly preferred position.

—EW—

CLEARING HOUSE – The Westinghouse company stands ready to contribute eight basic power system programs for use on IBM-704 computers to an industry clearing house, which might be administered by an organization such as EEI. The purpose of the exchange of information would be to speed the solution of common problems of different systems. Sharing computer programs would eliminate costly duplication and save thousands of man-hours in achieving ultimate solutions.

Until such a clearing house is available, the company will make the programs available to utilities that have gained familiarity with their use at the company's East Pittsburgh computer facilities.

—EW—

Dr. William S. Edsall, a native Westerner and prominent member of the electrical industry, has retired as president of Chase-Shawmut Co., a subsidiary of I-T-E Circuit Breaker Co. He will be succeeded by P. Gordon Johnston.

MICE ON ICE – British electronic engineers have created two teams of electronic mice playing ice hockey on a miniature rink of genuine ice.

The synthetic animals have photo-electric eyes that follow the puck as unerringly as any human player. Once a "mouse" gets the puck, it moves toward the goal in a realistic offense and defense play by the members of the two teams. There are three mice on each side.

—EW—

Harold E. Marmaros has been appointed manager of the economics department of Middle West Service Co. He comes to the company from Gibbs & Hill Inc., where he has been responsible for economic, ultimate economy and depreciation studies on various utility properties.

—EW—

MIRACLE MAN—Brian Miracle, a 26-year-old commercial salesman for Pacific Power & Light Co. in Casper, has won national recognition for his talent with numbers. Miracle, who is also a former Olympic swimmer, won the "Outstanding Research" award of the National Foundation of Applied Mathematics. His paper, entitled "Semi-Groups and Their Functions," was one of 10 outstanding papers selected from 2,500 entered in a national competition.

The 27-page thesis included mathematical formulas 11 pages long.

He is a graduate of Tulane University with a degree in mathematics, and was a member of the 1952 Olympic swimming team and the 1955 Pan-American swimming team.

—EW—

Summer output peak for Public Service Co. of New Mexico hit 130,900 kw, compared to last year's summer peak of 110,260 kw—up 18%.

—EW—

TOP BILLING—Top billing, meaning the lowest combined monthly charges for gas, electric and telephone service, was won by two of California's metropolises. In an annual survey of the 25 largest cities in the United States made by the California Public Utilities Commission, San Francisco proved to be the lowest cost city with a total monthly bill for 50 therms of gas, 100 kwh of electric power and a two-party flat-rate telephone service of $11.03.

NEW! "Feather-touch" PUSH-to-TEST PILOT LIGHT

Added to Square D Oil-Tight Pushbutton Line

Completely oil-tight, even when depressed

Pressure connections eliminate internal wires

Positive contact "feel" in test position

No additional panel space required

Choice of 6 color caps

Full range of voltage ratings

Mounts interchangeably with oil-tight pushbuttons and selector switches

OIL-TIGHT OPERATORS

Here's why Square D Pushbuttons are preferred —by those who *build* machines—and by those who *buy* them!

Easy to use • Operators require only a single mounting hole for quicker installation. Pressure wire connectors mean simplified wiring.

Longer lasting • All-metal operator construction, anodized aluminum buttons, mean greater mechanical life. Melamine contact blocks with double-break silver contacts assure longer electrical life.

Wide flexibility • Any operator can be used with any contact block to meet all your requirements.

Small size • Only a minimum of panel and back-of-panel space is required.

Variety of contacts • Contact block arrangements include single-pole double-circuit, duplex double-circuit, tandem duplex, three-position duplex, and overlapping contacts.

• • •

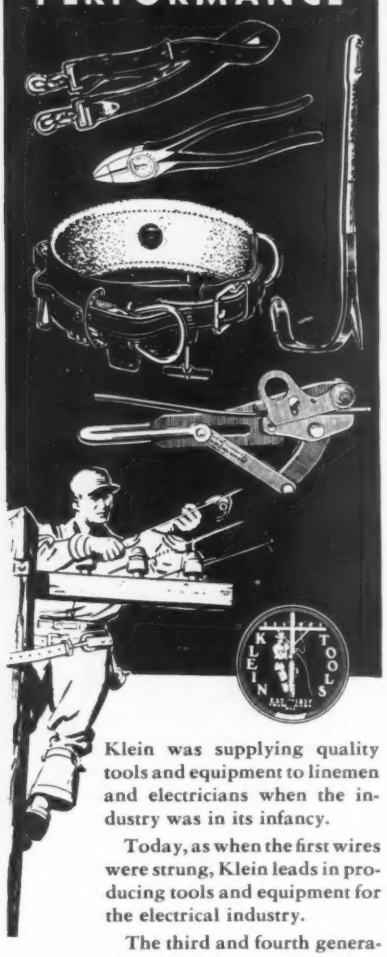
FOR COMPLETE INFORMATION *on oil-tight pushbuttons, send for Bulletin 9001-T to Square D Company, 4335 Valley Boulevard, Los Angeles 32, California.*

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY

KLEIN

FOR GREATER SAFETY, BETTER PERFORMANCE



Klein was supplying quality tools and equipment to linemen and electricians when the industry was in its infancy.

Today, as when the first wires were strung, Klein leads in producing tools and equipment for the electrical industry.

The third and fourth generations of Kleins are still adhering to the quality standards set a century ago. The new Klein plant, equipped with the latest in manufacturing facilities, assures better, safer equipment, wherever power lines or communication lines are strung.

FREE POCKET TOOL GUIDE

A free copy of the new Klein Pocket Tool Guide will be sent on request without obligation.

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Los Angeles was third with $11.48 for the three services and Seattle was fifth with $11.57.

—EW—

John L. Burns, president of the Radio Corp. of America, reports that in Russia, the take-home pay of the top echelon workers is 80 times as great as those at the bottom. In the U.S. the ratio is barely 10 to one.

—EW—

AS GOOD AS THE MACHINE—Utility management should be as thorough in choosing and training operating personnel as it is in selecting and designing equipment, M. J. Thrasher of the Long Island Lighting Co. declared in an address to the AIEE.

He emphasized, "Even with the best of equipment and maximum of automation, the continued successful performance will depend upon the human element." It is necessary, therefore, that "a similar approach should be made in the selection of the operating personnel as that used for equipment."

Thrasher recognized the difficulty in evaluating the ambiguous "human elements" but pointed out that psychological testing and careful observation made it possible to assess these characteristics.

TECHNICAL LITERATURE—A real need in the industry has been ably fulfilled by E. B. Curdts' able treatment of "Insulation Testing by D-C Methods."

In this rapidly developing area, where considerable difference of opinion has existed, Curdts is to be congratulated on the rigorous but terse manner with which he treats the subject. The material is amply and aptly diagrammed—a "must" for engineers concerned with maintenance of insulation in electrical apparatus.

Copies are available for $2 from James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

—EW—

Congratulations to PG and E's Vivian Estcourt for his prize-winning ASME paper entitled "Plant Management and Other Factors Affecting Maintenance Cost in Steam Generating Stations."

—EW—

INCREASED SUPPLY OF ENGINEERS—Compared with an electrical engineering graduating class of 7,510 from ECPD accredited schools in 1956-57, the 1957-58 year is expected to have graduated 8,500, with 1958-59 projected for 9,500.

Even in the advanced degrees, it

Human Relations—Answer These Questions to See Where You and Your Organization Stand

	True	False
1. A manager who knows human relations is able to control his subordinates.	.....	.....
2. Human relations are a lot of bunk.	.....	.....
3. It's better to know a lot about people and a little about the job at hand than vice versa.	.....	.....
4. A good scrap never takes place in a well managed company.	.....	.....
5. Nobody around here dares take issue with my boss.	.....	.....
6. I like my boss to level with me.	.....	.....
7. Supervisors should hold occasional department meetings to talk about what's going on and to give everyone a chance to contribute.	.....	.....
8. It is important to make people think they are important, even if they are not.	.....	.....
9. Understanding of human relations may cause a manager to change his own habits.	.....	.....
10. If a man practices human relations methods, he can still be a driver.	.....	.....
11. Human relations are the most important thing in any business.	.....	.....

(Answers are on p 63)

appears that 1959 will be a banner year, with the production of Ph.D.s estimated to be 9,750—the first increase since 1954, when 8,996 Ph.D.s were granted.

—EW—

Portland General Electric Co.'s thunderbolt has been streamlined out of business. Long a part of the insignia carried on PGE vehicles as a lightning flash striking a bull's-eye, the bolt has now been dropped. The reason? Not enough flat space is left on the sides of modern vehicles to hold both the bolt and the bull's-eye encircling the letters PGE.

—EW—

RESEARCH—The RLM Standards Institute, the Association of Certified Ballast Manufacturers and the National Electrical Manufacturers Assn. are individually considering the underwriting of an investigation into the causes of overheating of fluorescent fixtures and component parts.

The investigation and report are to be made by an independent testing laboratory. The three organizations hope that this study will provide data for obtaining a reduction in fixture operating temperatures.

—EW—

Duro-Test's fluomeric lamp has been recognized as a new light source by the Illuminating Engineering Society. The lamp contains some features of incandescent, fluorescent and mercury vapor lighting all in one unit.

—EW—

INVASION—A horde of spiders invading McNary Dam sent the operators into a tizzy recently. The spiders were believed to have been brought to the dam by debris floating downstream during the spring runoff of the Columbia River. An insecticide fog machine, using a chlordane-base insecticide, was brought into action to destroy the invaders.

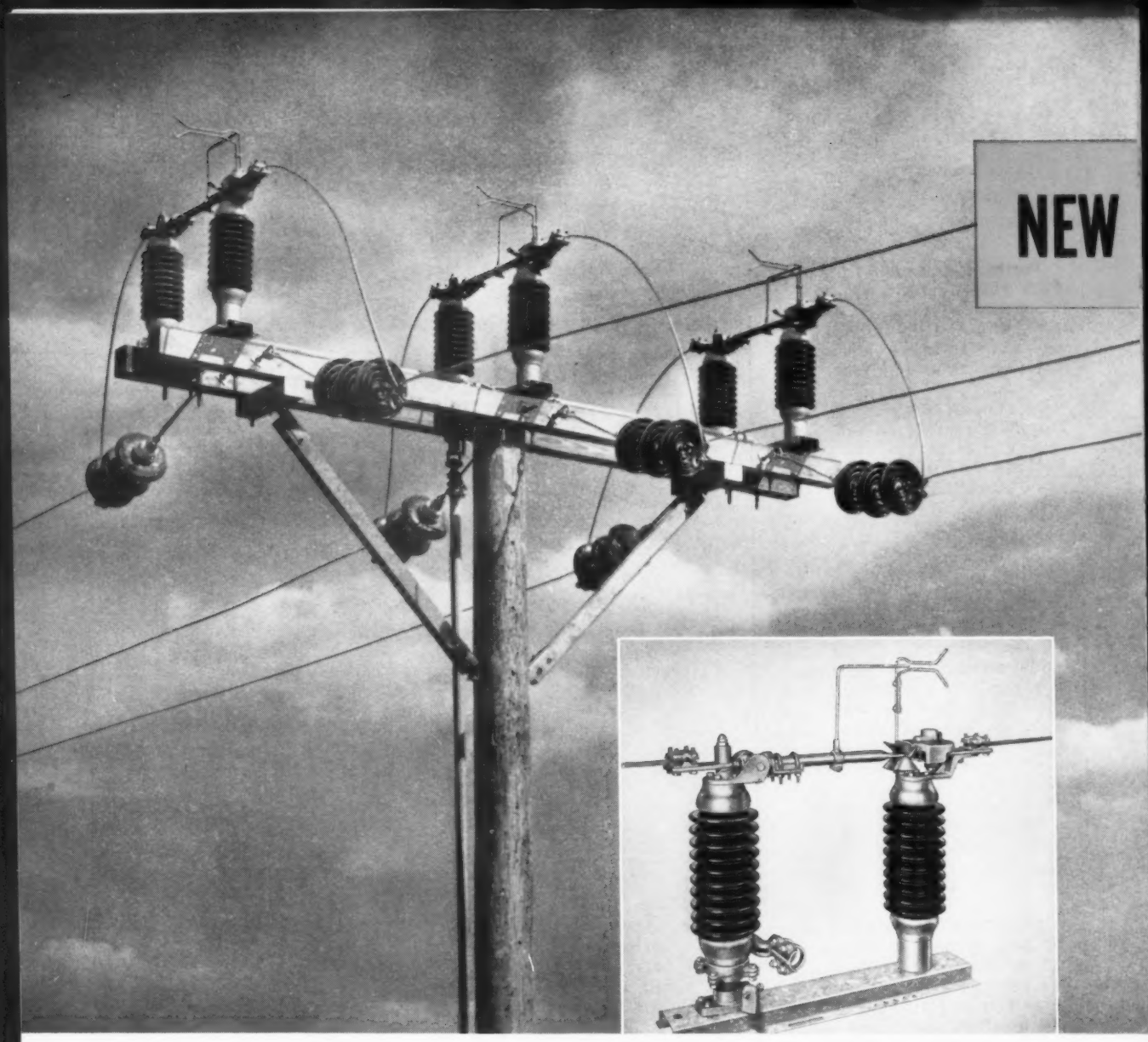
—EW—

From Don Larson, business manager of the recent WESCON Show in Los Angeles, we learn that registration was 33,223. Pretty good for a four-day meeting.

The clean, simple lines of Southern States connectors didn't just happen. The recessed hexagonal bolt heads, or proven alloys, didn't either. Nor did the resultant over-all strength, ruggedness, and durability of these high-quality fittings. All of those characteristics, which you look for in connectors, are the result of careful engineering, backed by more than 25 years experience in producing these products — from drawing board, to foundry, to you.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto



NO OTHER SIDE-BREAK DISCONNECT GIVES YOU ALL OF THESE OPERATING ADVANTAGES

- **Correct contact always maintained at blade tip even if crossarm warpage distorts the switch base.**
- **All blades engage fully in the break-contact jaws without precise adjustment of the inter-phase rods.**
- **Less time and labor to install with Kearney original wide-tolerance mechanical design.**
- **Easiest, surest ice-breaking ability available on both opening and closing.**

This newest Kearney development solves long-existing operating problems of crossarm mounted group operated side-break disconnects. The best supporting structure or crossarm construction may . . . due to ice loads, age, wind or line strain . . . deflect enough to distort the switch bases, or alter the relative positions of the three phases. This often causes loss of contact or failure of all blades to close completely in conventional disconnects with both rigid blades and stationary break-contacts.

Kearney's advanced design features a self-aligning blade constructed to permit controlled vertical movement and axial rotation. This automatically compensates for base distortion . . . keeps the blade tip correctly aligned in the contacts. The break-contact swings 30-degrees with the blade as it is opened or closed, producing high leverage ice-breaking ability and full wiping of the silver current transfer surfaces. On closing, the blade tip fully engages the break-contact before the contact moves from its angular open position, compensating for any shift in position of the switch bases. This same feature also allows considerable freedom in interphase rod adjustment, enabling Kearney ***Self-Aligning*** side-break switches to be installed faster and more economically than other types.

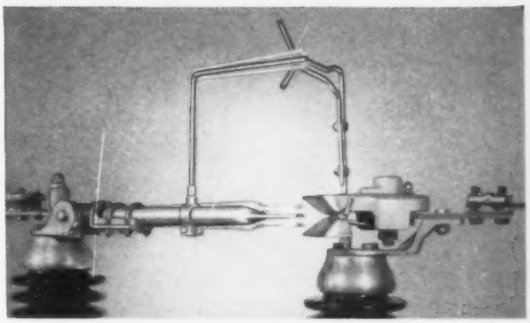
The details of these original features for maintenance-and-adjustment-free operation are shown on the facing page.

Kearney's

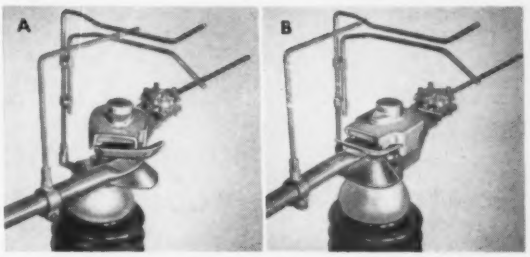
Self-Aligning SIDE-BREAK DISCONNECTS

...always make positive contact, even if the supporting structure warps, twists, bows or settles.

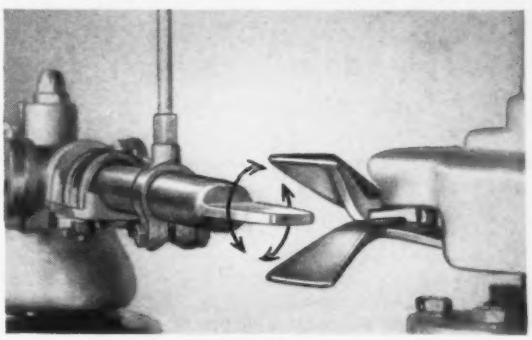
Self-aligning blade moves in a vertical plane to re-establish the original relationship between blade tip and contacts if supporting structure warpage distorts switch base. Wide mouth contact jaws assure blade entry into the contacts. Vertical 1¼" movement more than corrects for extreme cases of misalignment.



Break-contact swings 30° in the plane of blade travel as switch is opened or closed, providing highest leverage ice-breaking and full wiping of the current transfer surfaces. Note that the blade tip is fully engaged, and full contact is maintained (A) through the final 20° of blade travel to the fully closed position shown at (B). This feature allows more latitude in phase rod adjustment than other designs.



Blade rotates 12° on its longitudinal axis. If base distortion has affected blade-contact alignment, the blade tip will rotate as it enters the break-contact to keep all contact surfaces parallel, automatically restoring contact alignment. Friction reducing construction at all rotation points minimizes operating effort.



Switch carries full-rated load current well within NEMA temperature rise, from a fully closed position to 20° partially open position. Ratings available, 7.5 through 69 kv, 600 amperes. Equipped with conventional or whip-type arcing horns... torsional or spade-type operating mechanism. May be mounted horizontally, vertically, or underhung.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Avenue, St. Louis 10, Missouri

IN THE WEST: for prompt service, contact Kearney's West Coast Distributor, **Maydwell and Hartzell, Inc.,**
Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix.

397

FOR BETTER CONSTRUCTION... SAFER MAINTENANCE

Specify Kearney Products

Plants at: **ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA**

What? Remember all these items?

No—let one Anaconda Cable Jointing Kit do the job—it will....

- Save design time
- Reduce inventory problems in supply room
- Pinpoint responsibility
- Save time accumulating material
- Save extra trips for missing materials
- Simplify ordering

Joints are not difficult to make—*if* you have *all* the proper materials at the right place at the right time!

But to make sure you do have them, many steps are involved: You must design the joint. An accurate bill of material must be written. You must take care of the purchase of each individual component and expedite and coordinate delivery to assure the arrival of all materials on the job site at the right time.

How much easier to take care of it all in *one* step—with a completely engineered cable jointing kit from Anaconda! No time wasted on designing, purchasing, expediting or coordinating! Each Anaconda kit contains *everything* you need for one complete splice! Including drawings and instructions!

In addition, ordering is simplified and responsibility is concentrated when you order your accessories and cable from the same manufacturer. When that manufacturer is Anaconda, you know that your accessories have been designed *right*—by people with years of experience in cable development.

Anaconda also offers a complete line of potheads for all types of power cable. The parts are interchangeable for greater adaptability, easier installation, faster delivery, lower cost.

Get in the habit of ordering your accessories when you order your cable—from Anaconda. For full technical data on all Anaconda Cable Accessories, see your local distributor or the *Man* from Anaconda. Cable Accessories Technical Catalog (C 79: 13-14) available on request. Please write Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York. 58835

FASTEST WESTERN SERVICE—At Orange, California, Anaconda's expanded, modernized mill fabricates and stocks copper and aluminum wire and cable for *every type of application*. Anaconda assures the fastest possible service on all West Coast needs. See Anaconda Sales Offices: Los Angeles, San Francisco, Seattle, Denver.

LIVE BETTER ELECTRICALLY

SEE THE MAN FROM ANACONDA®

FOR CABLE ACCESSORIES

PRODUCT NEWS

New Designs and Applications

Underground Transformer

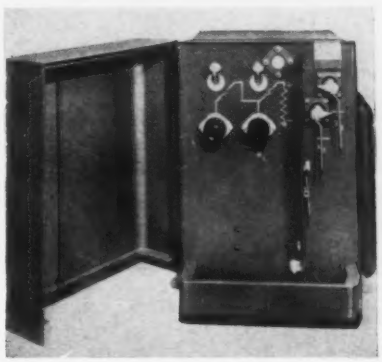
(1) *RT&E Corp., Waukesha, Wis.*

A new transformer designed specifically for application to underground distribution systems has been announced by this company. The transformer is completely self-contained and is designed to be mounted on a concrete pad above ground level. No separate enclosure or protective equipment is required for installation. To protect the public and linemen from accidental contact, all live parts are enclosed in a locked compartment and a welded-on cover is used. For operation and maintenance, access to the bushings, fuses and disconnects is gained by opening the hinged door on the operating compartment. Special externally clamped high-voltage bushings, designed for easy cable connection, and externally clamped low-voltage bushings are used. A new high-voltage fuse for isolating the transformer from the line in the case of a transformer failure is supplied on protected-type transformers. It is of bayonet design and can be removed externally for replacement of the fuse element. In conjunction with the externally replaceable fuse, an externally operated bayonet-type disconnect switch has been developed to sectionalize portions of the circuit. The new transformer is available in single-phase units in a range of sizes from 15 kva through 100 kva for operation on 4,160 ground Y/2,400 through 12,470 ground Y/7,200 volt grounded Y systems. It will also be available in three-phase units in a range of sizes 75 kva through 300 kva for operation on all standard 2,400- through 14,400-v three-phase systems.

Installing Tool

(2) *Thomas & Betts Co., 36 Butler St., Elizabeth, N. J.*

To speed installation of lugs, splices and pigtails, a new hand installing TBM-2 tool with a built-in rotating die has been designed by this company. Color-keyed dies and connectors further simplify installation. Proper die is selected by rotating it to the color matching that of the connector to be installed. A positive acting feature in the tool forces the installer to give maximum design compression before releasing the tool. The tool will install lugs and splices on code copper cable from No. 8 AWG to No. 2 AWG; copper pigtails from three No. 12s to three No. 8s; aluminum lugs and splices from No. 12 to No. 6; and lugs and splices on flexible copper cable from No. 8, No. 6 and No. 4.



Mid-Span Clamp

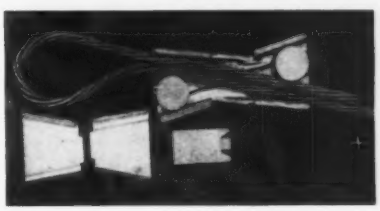
(3) *Anderson Electric Corp., P. O. Drawer 2151, Birmingham 1, Ala.*

This new midspan wedge clamp can be used to connect as many as four triplex house service neutrals. It is of one-piece design with all cable entrances heavily flared to protect cable during installation and from continuous vibration. The connector is attached to the neutral main by means of a one-center-bolt type of connector with ½-in. bolt. The taps are pulled in around the wedge-arc and released. The tap cable will wedge down into the tapered groove to be held by the clamp's tapered groove. The clamp "main" is designed for No. 4 ACSR to No. 2/0 ACSR, and the tap grooves will accommodate cables from No. 6 solid to No. 2 ACSR.

Lamp Changer

(4) *Raymond Johnson Mfg. Co., P. O. Box 7504, Oklahoma City, Okla.*

This company offers a line of new tools designed for changing fluorescent and slimline lamps. Called Reach-A-Lamp, the tool can be used to change lamps and starters, and will remove and replace some of the diffusers used on fixtures. The use of stepladders is eliminated. "Fingers" grip the lamp when manipulated by a control built into the handle. Full details and literature are available from the manufacturer.



Boltless Clamp

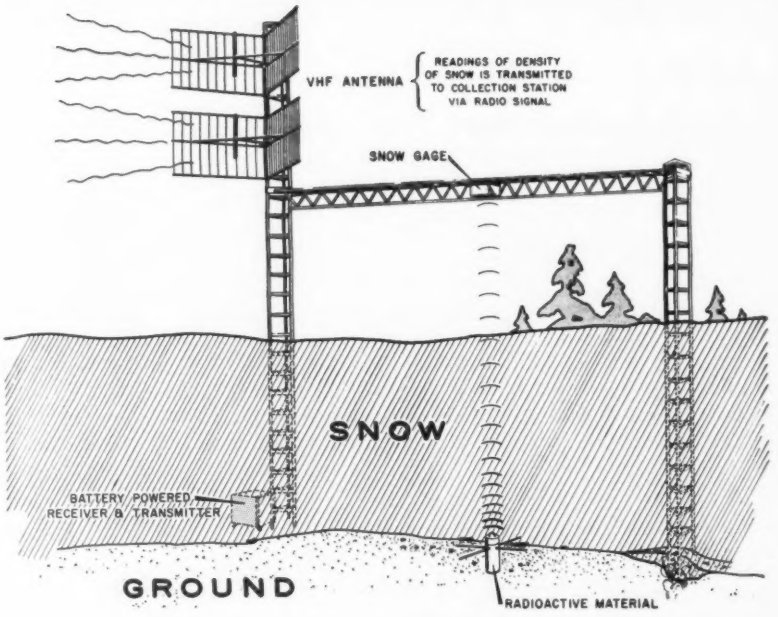
(5) *Clamps Inc., 5th Ave. & E. 10th St., Oakland, Calif.*

Said to require neither nuts, bolts nor maintenance, this new self-lock-

ing clamp for wires and cables is currently being introduced to national markets. Advantages claimed are: a 30% to 50% reduction in labor and installation time and a series of tests showing that it holds without slipping beyond the breaking strength of guy wires and cables. The new clamp is comprised of four parts: a housing equipped with two adjustable hard steel rollers that lock the wire or cable by friction, two clips that slide over the main body of the housing and rollers, and a safety bar that slides in between the clips to lock them permanently. It weighs 1.2 lb and accommodates wires or cables of various sizes.

Electronic Snow Gage

(6) *Sierra Electronics Corp., 3885 Bohannon Dr., Menlo Park, Calif.*

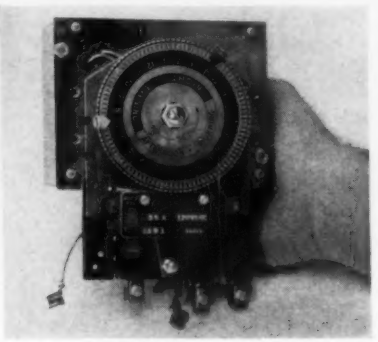


This company has designed an electronic-telemetering system for measuring the water content of snow. Hydrological data will be collected by a snow gage radiation detector that is similar to a Geiger counter, and will be relayed via VHF radio antennas and towers. All towers are at remote, unattended sites. Radiation for measuring the water content of the snow is supplied by a deposit of radioactive cobalt buried at ground level directly below the snow gage. As the radiation from the cobalt passes through the snow to the detector, some radiation is absorbed in proportion to the amount of water in the snow. Coded query messages will go through the relay stations to the unattended snow gage sites. As each site receives its interrogation, the battery-powered VHF radio transmitter is switched on and the hydrological information is beamed to the data collection station. All of the receivers are transistorized to conserve battery power. Snow gages are programmed to report and record the hydrological data automatically each day, but a push-button "on call" feature can be utilized to obtain the information between regular reports.

Highway Sign

(7) *Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.*

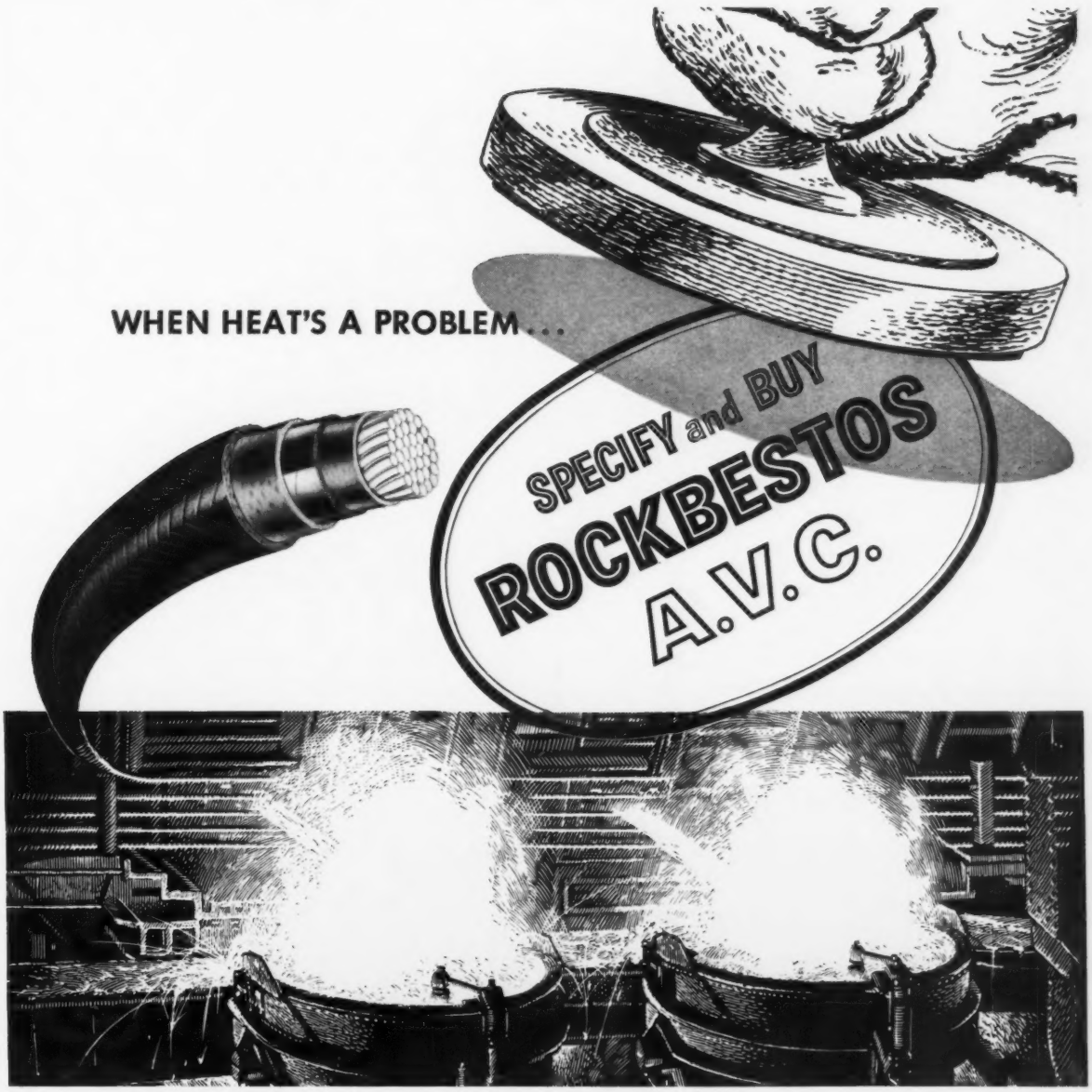
A new Panelescent lamp super-highway marking sign was recently demonstrated for the first time by this company. The letters of the sign are their own light source, with each letter composed of from one to three individual Panelescent lamps. The Panelescent lamp is a device that provides light over the entire surface of the panel by the principle of electroluminescence. Only 1/16 in. thick, the lamp produces a uniform light without the use of bulbs, tubes, filaments, cathodes or heavy ballasting devices. The lamp letters in the demonstration unit are mounted on a marine plywood backing and completely covered with an aluminum plexiglass window. The sign operates with a 580-v control device on conventional 60-cycle, 115/120-v supply. The original demonstration was made before the California Division of Highways electrical engineers by Leonard A. Komor, Sylvania's district lighting engineer in San Francisco.



Reserve-Power Switch

(8) *Power Section, Tork Time Controls Inc., Mount Vernon, N. Y.*

This company has designed a time switch that will continue to operate during electric power outages. Said to be an ideal control for switching



Steel Mill and Foundry "hot spots" provide one of industry's worst torture chambers for wire and cable. Heat, overloads and corrosive fumes combine to kill ordinary cable quickly.

Don't take a chance on ordinary cable for troublesome "hot spot" applications. *Specify and use Rockbestos A.V.C.*

This superior AVA cable, with asbestos, varnished cambric insulation, takes temperatures up to 230°F, assuring continuous operation in hot spot applications, provides greater current carrying capacity for increased and new loads.

When you *specify and buy Rockbestos A.V.C.*, you reduce your electrical maintenance and construction costs . . . you get years more dependable service.

Write now for the new Rockbestos RSS-88 to help you *specify and buy Rockbestos A.V.C.*

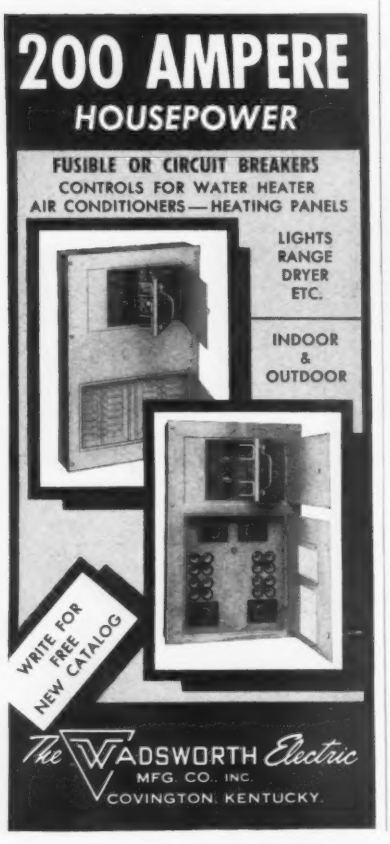
ROCKBESTOS PRODUCTS CORPORATION
NEW HAVEN 4, CONNECTICUT

NEW YORK • CLEVELAND • DETROIT • CHICAGO • PITTSBURGH • ST. LOUIS
ATLANTA • DALLAS • SEATTLE • LOS ANGELES • BURLINGAME, CALIFORNIA

ROCKBESTOS A.V.C.

THE SUPERIOR A.V.A. CABLE

INDIANA STEEL & WIRE CO. MUNCIE, IND.
Crapo Galvanizing
Signs along the lines of Crapo GALVANIZED STEEL STRAND PERFORMANCE
For dependable performance . . . insist upon Crapo Galvanized Steel Strand. Superior tensile strength, combined with long-life, ruggedness and workability, makes Crapo Steel Strand first choice for guys, messenger and overhead ground wire.
The famous Crapo galvanizing process provides dependable protection for the steel, prolongs the expectant life of the strand.
• Low maintenance cost
• Laboratory tested and controlled quality
• Meets highest quality standards
• A size and grade for all practical needs
• Contact your Crapo Jobber Today!
INDIANA
STEEL & WIRE CO., INC.
Muncie, Indiana



capacitor banks, the unit has a spring mechanism that provides reserve power in the event of an electrical outage. The spring is wound electrically and automatically. When power fails, the reserve mechanism takes over and keeps the time switch in operation for up to 17 hours. With power restored, normal a-c operation of the time control is resumed, and at the same time the reserve spring is rewound. A 55-amp unit is available for capacitor switching.

Fiber Glass Ladder

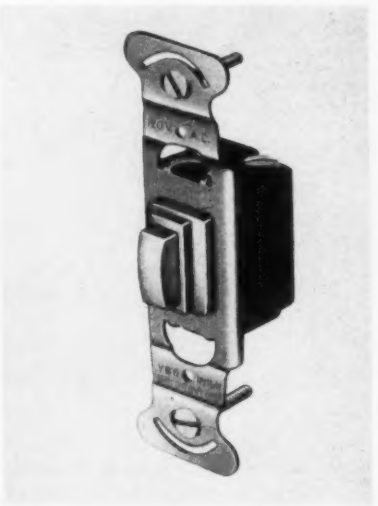
(9) *Hopfield Industrial Mfg. Co., P. O. Box 54, San Rafael, Calif.*

This company announces the availability of a new fiber glass ladder in both straight and extension models. The ladder has a specially prepared wood core for safety without increasing the weight. Dielectric strength is said to be about 450 v per mil of thickness, thus the ladder is nearly 100% nonconductive. Light weight and a patented locking device on the extension ladder are features.

Quick-Disconnect Fixture

(10) *Crouse-Hinds Co., Syracuse 1, N. Y.*

This company has designed a quick-disconnect vapor-tight lighting fixture that can be installed and removed in a few seconds. Designed for areas where a lighting fixture might ordinarily be an obstacle but where light is sometimes needed. With weatherproof receptacles installed in a number of convenient locations indoors or outdoors, the fixture can be carried by maintenance personnel from one location to another.



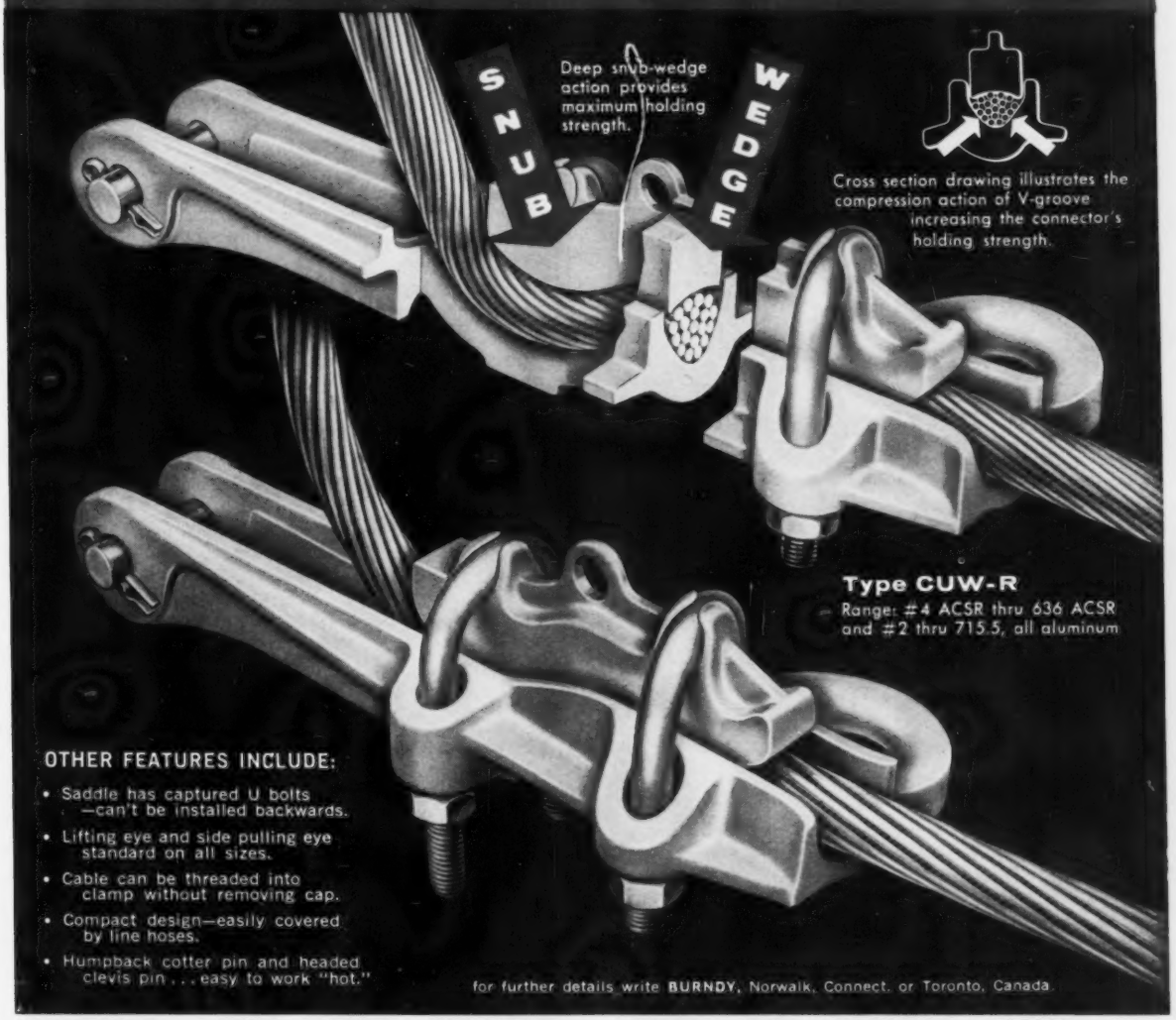
Tap-Action Switch

(11) *Arrow-Hart & Hegeman Electric Co., Hartford, Conn.*

Designed to fit any toggle wall plate, this new switch is said to eliminate the need for special, expensive wall plates. Called the Junior Quiette, it is supplied with binding screw-type terminals in single or double pole, three-way or four-way, with brown or ivorylite operating buttons. If desired, operating buttons are supplied with luminous inserts.

get the inside story on this aluminum

DOUBLE ACTION
LOW COST
DEAD END CLAMP

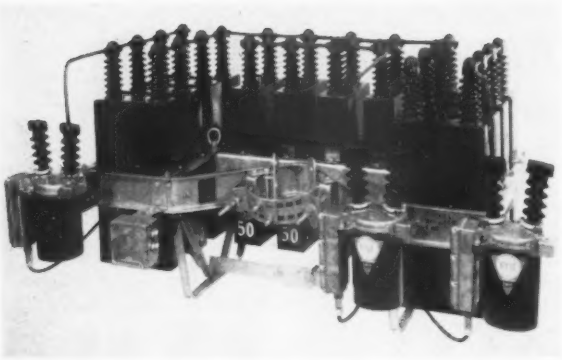

SNUB
WEDGE
Deep snub-wedge action provides maximum holding strength.
Cross section drawing illustrates the compression action of V-groove increasing the connector's holding strength.
Type CUW-R
Range: #4 ACSR thru 636 ACSR and #2 thru 715.5, all aluminum

OTHER FEATURES INCLUDE:

- Saddle has captured U bolts —can't be installed backwards.
- Lifting eye and side pulling eye standard on all sizes.
- Cable can be threaded into clamp without removing cap.
- Compact design—easily covered by line hoses.
- Humpback cotter pin and headed clevis pin . . . easy to work "hot."

for further details write **BURNDY**, Norwalk, Connect. or Toronto, Canada

BURNDY



Cluster-Mount Capacitor

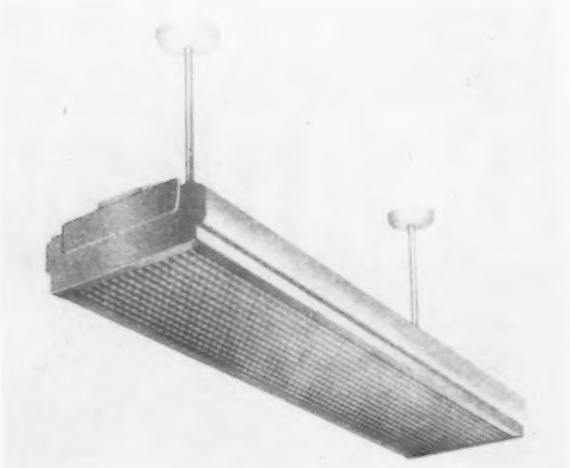
(12) *Sangamo Electric Co., Springfield, Ill.*

A new prewired 12-unit cluster-mount capacitor equipment, capable of handling up to 600 kvar with ratings through 7,960 v, is announced by this company. Designed for ease of handling, the pole top equipment is mounted with a compression-type bracket that eliminates the need for through bolts. Additional features include free climbing space in excess of 33 in., readily accessible oil switches and an adjustable kicker bracket for easy leveling after installation.

Mobile Electrification

(13) *Insul-8-Corp., 1369 Industrial Rd., San Carlos, Calif.*

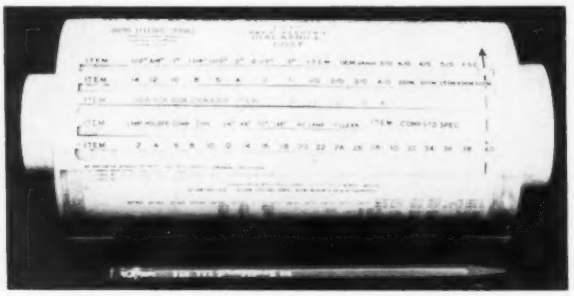
New 1,000-amp conductor systems of mobile electrification offered by this company are designed specifically for heavy duty applications. Called Hevi-Bar, the system can be installed as an open bare conductor system or as an enclosed system. It consists of three basic components: aluminum conductor bars, sliding shoe trolley collectors and hanger clamps. When used as a safety-type system, the conductor bars are enclosed in specially compounded PVC plastic covers. Contact surfaces of the aluminum conductors are heavily clad with a hard, high melting point material that is said to give permanent protection against oxidation and arcing. Conductor bars, available in 10- and 20-ft sections, are welded together in the field by the Cadweld process.



General Purpose Fixture

(14) *Smoot-Holman Co., P. O. Box 4097, Inglewood, Calif.*

The chassis of this fixture serves as a base upon which about 100 different fixtures can be assembled. The sides may be equipped with metal, glass or plastic; the bottom with metal louvers, plastic louvers or various plastic diffusers, or diffusing glassware. Basic units are 4, 6- and 8-ft long.



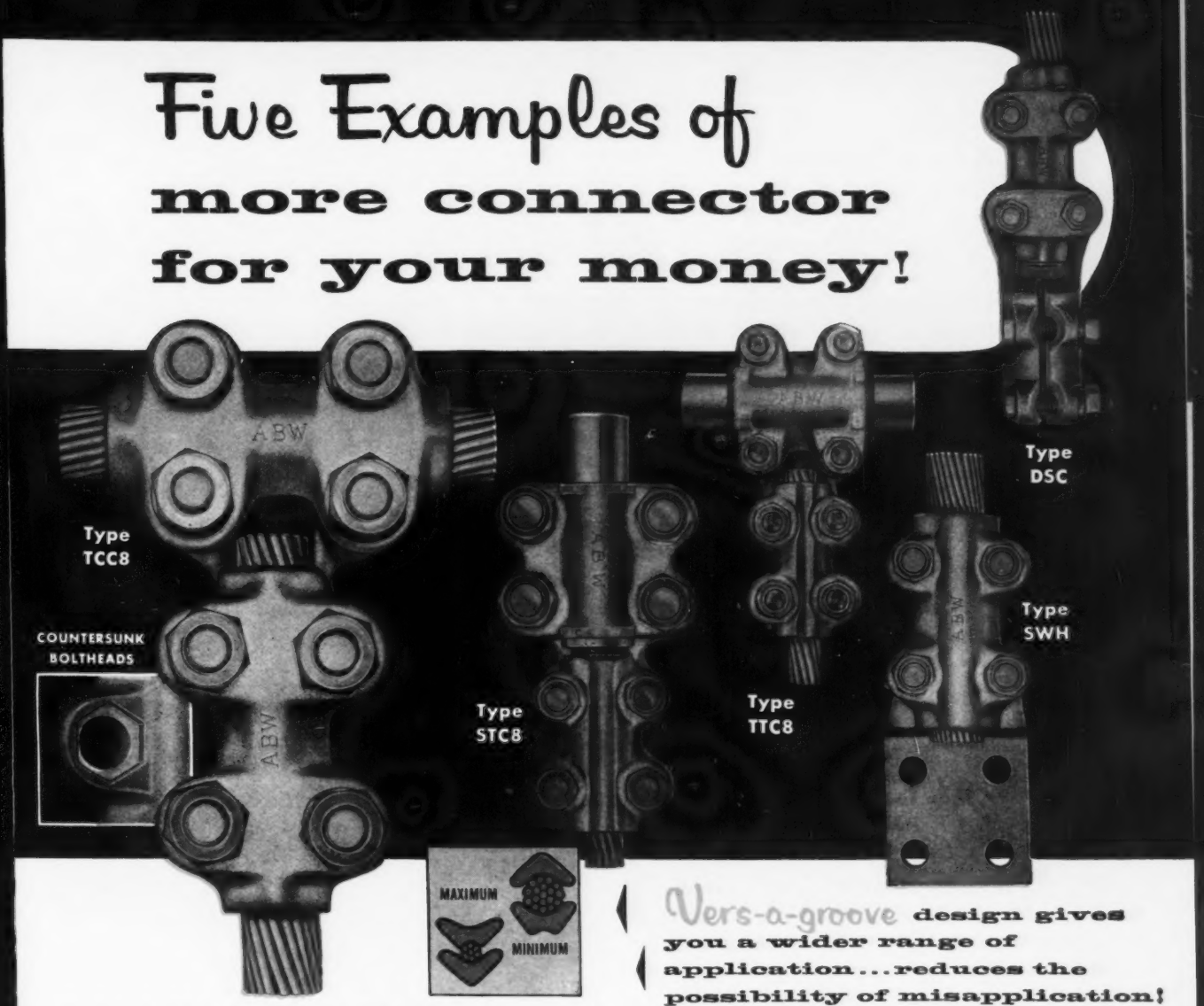
Dial-A-Price

(15) *Rapid Electric Service, 1348 Grandview Ave., Glendale 1, Calif.*

To reduce the time and effort involved in pricing estimates and invoices by electrical contractors, this company has developed a device and service that is said to provide fast access to information about approximately 90% of the items found on estimates and invoices. The replaceable form on the ruler carries identification and pricing information. Replacements are supplied by the company as a regular service.

Bulletins and coupon are on p 28

Five Examples of more connector for your money!



Vers-a-groove design gives you a wider range of application... reduces the possibility of misapplication!

The 9 *stand-out features* of these Anderson Substation Connectors cannot be duplicated by any other connector line available. Look over these features carefully... *several manufacturers may claim some of them, but no connector line has them all!*

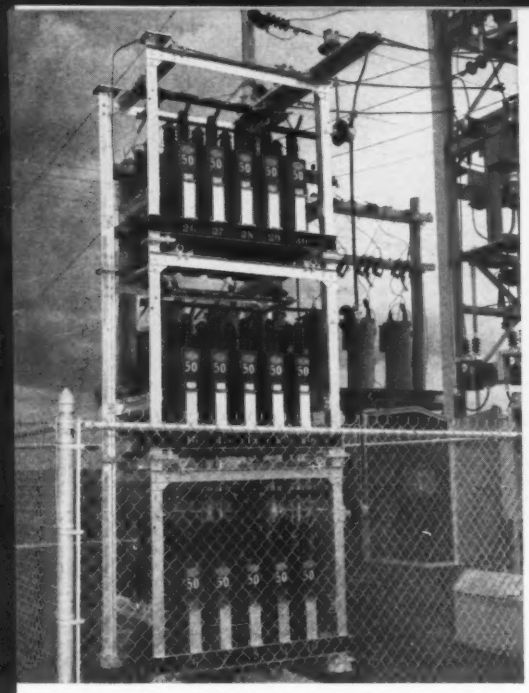
1. Two complete pairs of clamping bolts on both main and tap provide *extra insurance* against connector failure. *Most other designs have only six bolts.*
2. Higher clamping pressures with greater contact lengths *than in other standard connectors.*
3. Completely independent (3-piece) clamping on main and tap. Connection can be removed on one side without disturbing contacts on the other. *Most other connectors are two-piece.*
4. Conductor range practically eliminates mis-application and resulting connector "burn-downs". *Limited or no range of other connectors invite mis-application trouble.*
5. Wider conductor ranges permit considerable reduction in overall number of connectors which must be carried in inventory. *Two and three times greater inventory is required with other connectors.*
6. More connector for the money! More metal... 8 bolts instead of the ordinary 6 bolts!
7. One of the greatest advantages of these Anderson Vers-a-groove Tee Connectors is *ease of installation.* The 3-piece design, with independent clamping on main and tap, means that tap conductors may be bolted in on the ground and passed up to install over the bus runs. *Ordinary 6-bolt, 2-piece connectors much more cumbersome and difficult to handle.*
8. Cast surfaces which are inherently rough and tough mean positive electrical contacts. This feature plus the greater clamping strength of these connectors is a *distinct advantage in overall efficiency.*
9. The design of these connectors, by Anderson, has proved itself over more than 27 years of service under all conditions in all parts of the country. *Once used... tried and proved... no customer has ever switched back to an ordinary connector.*

For more complete information, including engineering and design data, performance characteristics and other particulars, consult your nearest Anderson Representative, or write to our home office.

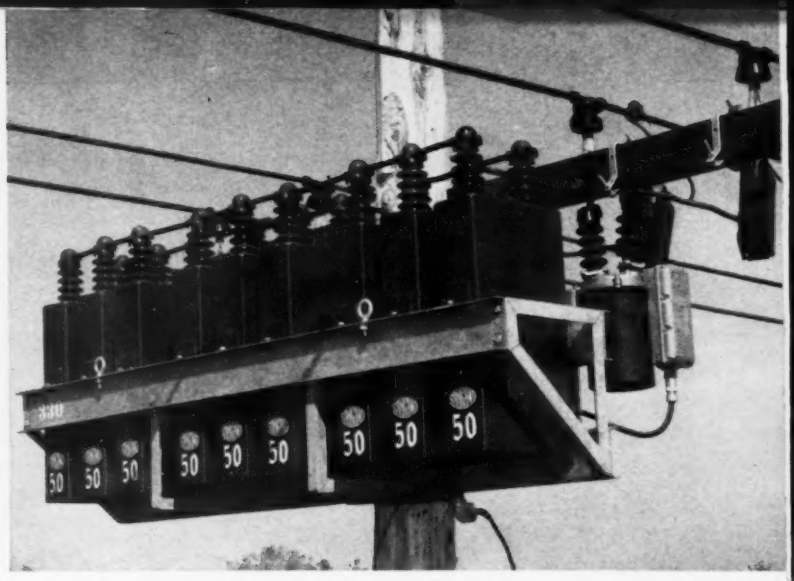
ANDERSON ELECTRIC CORPORATION • Birmingham 1, Alabama

ANDERSON ELECTRIC

Research | Quality | Performance | in Aluminum and Bronze Products



OPEN-TYPE EQUIPMENTS... Singlephase stacking units can be arranged in combination to give any desired bank kvar at subtransmission and transmission voltages. Three phase open-type racks are available for small bank installations at substations.



AUTOVAR EQUIPMENTS... These factory-assembled, pre-wired pole-type equipments permit fast, easy, and low cost capacitor installation on distribution circuits—available in multi-row, in-line, cluster mount, or designs to user specications.

SANGAMO can fill all the *MOST COMPLETE*

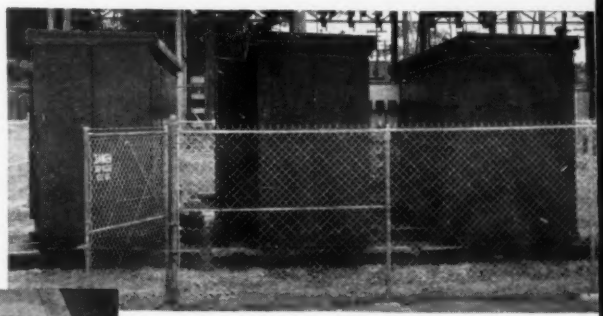
Whether you install power factor improvement capacitors in banked high voltage units or as individual low voltage units, you can make Sangamo your primary source of supply for all your capacitor needs.

Sangamo offers the most extensive line of primary and secondary capacitors, equipments, and controls available from any manufacturer.

For more information ask your Sangamo Representative or write for Bulletins 1110, 1130 and 1131.

INDIVIDUAL UNITS... Sangamo 15, 25 and 50 kvar primary power capacitors are built to utility engineers' specifications to assure "performance stability." They are stocked in all NEMA voltage ratings, and special ratings can be readily supplied.

HOUSED CAPACITOR EQUIPMENTS... Engineered for safety and appearance, Sangamo housed capacitor equipments provide a compact installation. They can be supplied with automatic control, and with or without circuit breakers.



UNDERGROUND EQUIPMENTS...These enclosed submersible primary capacitors provide kvars in locations where overhead pole space is not available. Capacitor units are completely sealed to guard against mosture or submersion in underground vaults.

Type S Plug-in 2 kvar unit, for meter socket mounting.

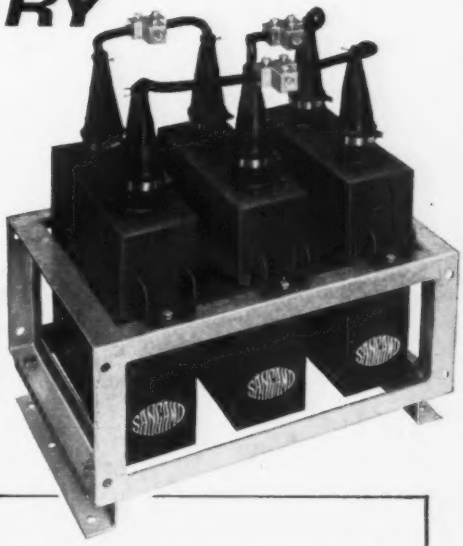
Type N Nipple connected 3 kvar unit, for three phase service.

Type N Nipple connected 1 kvar unit, for adjacent mounting.

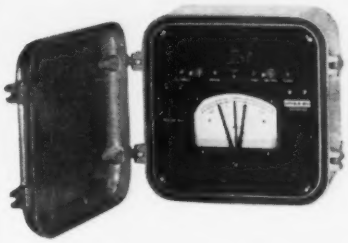
SECOVAR SECONDARY CAPACITORS... Only Sangamo can offer these 240 volt capacitors for installation at the customer's service to give maximum system benefits all down the line. They give the advantages of low first cost—quick and easy installation—installation off the pole. Secovar capacitors are available in three types with optional thermostatic switch for automatic operation.

your capacitor needs from *LINE IN THE INDUSTRY*

SECONDARY CAPACITORS... Pole-type secondary capacitors for mounting directly to pole or cross arm. Indicating type fuses are available.



SUBMERSIBLE SECONDARY CAPACITORS ... These secondary capacitors are completely sealed against moisture. Ideal for low voltage underground network installations. Available in factory-assembled equipments to fit your needs.



Sangamo also offers the most complete line of automatic controls for your capacitor installations. Whether you wish to switch capacitors as a function of voltage, current, watts, vars, temperature, time—or combinations of these—Sangamo can supply a control for your application. No other manufacturer offers this variety.

PC58-5

LIVE BETTER ELECTRICALLY

SANGAMO Electric Company

SPRINGFIELD, ILLINOIS

An 8-tier run of Soapstone OCT-O-DUCT provides a new telephone link down hard-rock Nob Hill to colorful Chinatown in San Francisco.

YOU CAN ACTUALLY SEE SOAPSTONE DUCT SAVE YOU MONEY

1. Trenchside delivery of Soapstone OCT-O-DUCT eliminates field inventory problems and makes certain your duct is at your job when you need it.
2. OCT-O-DUCT's convenient 4-foot lengths can be quickly installed by 2-men crews even in narrow and deep trenches.
3. OCT-O-DUCT's exclusive, flat-sided design eliminates the need for expensive interlayer spacers. Duct will not roll.
4. OCT-O-DUCT is connected in the trench with easy-to-apply circular couplings making possible fast, rhythmic, production-line installation.

The many time- and work-saving features of Soapstone OCT-O-DUCT and full information on the sizes, bends and accessories available from this 30-year-old Company are contained in our Catalog and Installation Manual. For your FREE copies, drop us a note on your letterhead.

SOAPSTONE DUCT COMPANY
3985 Beach street
Oakland 8, California

Distributed in the West by
MAYDWELL & HARTZELL, INC.
SAN FRANCISCO, LOS ANGELES, SAN DIEGO, PHOENIX, PORTLAND, SEATTLE, SPOKANE

BULLETINS ETC.

(16) TRANSFORMER MAINTENANCE—A new booklet entitled "Preventive Maintenance of Power Transformers Through Modernization" is available from Westinghouse Electric Corp. It provides a guide for power transformer modernization, including component replacement descriptions, component adaptations and methods of oil preservation. Write to the company at Box 2099, Pittsburgh 30, Pa. Ask for B-7299.

(17) UNIT SUBSTATION TRANSFORMERS—Information on the complete line of transformers used in its unit substations is given in a new bulletin published by I-T-E Circuit Breaker Co., Philadelphia 30, Pa. Presented are ratings and construction details of the various transformer types available. Address your request to the Transformer & Rectifier Division of I-T-E.

(18) CONDULET BREATHERS AND DRAINS — Crouse-Hinds Co. Bulletin 2702 explains how breathers and drains add to the life of explosionproof electrical equipment. For your copy write Crouse-Hinds Co., Syracuse 1, N. Y.

(19) INSULATORS — The final three in a series of five Thomas insulator catalogs have been published by Delta-Star Electric Division, H. K. Porter Co. Inc., Lisbon, Ohio. The new publications are: Pin Type Insulators (1100), Apparatus BIL Insulators (1125) and Guy Strain Insulators (1150). Earlier publications were: Suspension Insulators & Hardware (1000) and Conductor Clamp Selection Tables (1050). All are available now.

(20) WIRING DEVICES — A new 76-page catalog illustrating more than 1,500 electrical wiring devices, lamps and specialty products has been issued by Eagle Electric Mfg. Co. Inc., 23-10 Bridge Plaza South, Long Island City 1, N. Y. Besides the wiring devices, the catalog carries illustrations and information about a complete line of merchandising displays.

(21) INTEGRAL DISTRIBUTION CENTERS—Bulletin GEC-1355A offered by General Electric Co., Schenectady 5, N. Y., provides application and technical information on the company's integral distribution centers, rated 112½ kva and above, liquid-filled, and 300 kva and above, open and sealed dry. Given are comparisons of three types of transformers. Photographs, line drawings, charts, diagrams and tables are all used for illustration.

(22) FEEDWATER REGULATOR—Bulletin 1044, recently published by Copes-Vulcan Division, Blaw-Knox Co., Erie 4, Pa., describes the company's BI feedwater regulator. It is a single-element unit employing a thermostatic-tube level controller that actuates a regulating valve in the feed line. Working parts are illustrated and a schematic diagram shows how the different units are arranged into a complete control system.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST *Not good*
68 Post St., San Francisco 4, Calif. *after January 1*

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22

If described in advertising, fill in page number

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

TWO IMPORTANT NEW FACTS ABOUT KAISER ALUMINUM AAAC

1. AAAC now available on an unlimited basis!

In the three years since Kaiser Aluminum first introduced AAAC, this revolutionary new all aluminum alloy conductor has been offered on a limited basis so that we could keep accurate records of its performance.

During this time, over two million pounds of Kaiser Aluminum AAAC—installed in widely varying locations—have been thoroughly tested and job proved. Results of these 3-year tests prove conclusively that AAAC offers remarkable new advantages in performance, economy and corrosion resistance.

These results have *far exceeded* our most optimistic expectations and we are now ready to offer AAAC for unlimited general use.

2. AAAC accessories now available from leading accessories manufacturers!

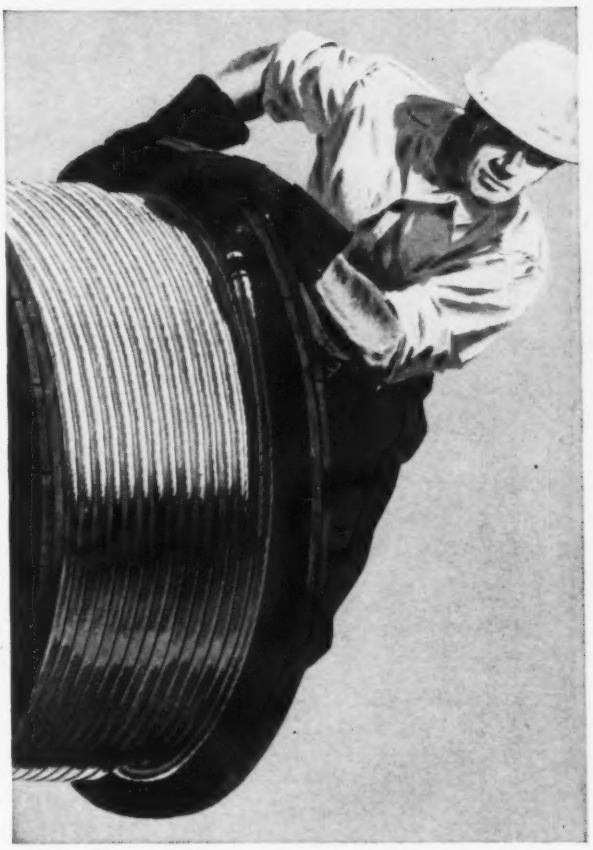
Leading manufacturers of armor rods, automatic splices and compression joints have recently established a full range of availabilities for these accessories. You'll find them listed and priced in published catalogs.

Many of these accessories have been tested on the same installations used by Kaiser Aluminum for proving AAAC. These tests have resulted in simplified installation techniques for miles of installed lines.

Your present KW distributor is a dependable source of top quality AAAC accessories.

KAISER ALUMINUM

IF IT CARRIES CURRENT, KW CARRIES IT!



SEND FOR FREE AAAC BOOKLET

Yours for the asking...all the facts about new Kaiser Aluminum AAAC, complete with engineering data and ordering information, wrapped up in a concise, informative booklet. Get your copy now by mailing in the handy coupon below.

PLEASE SEND YOUR FREE BOOKLET CONTAINING FULL DETAILS ABOUT AAAC

Kaiser Aluminum & Chemical Sales, Inc.
Dept. 952
919 N. Michigan Avenue, Chicago 11, Ill.

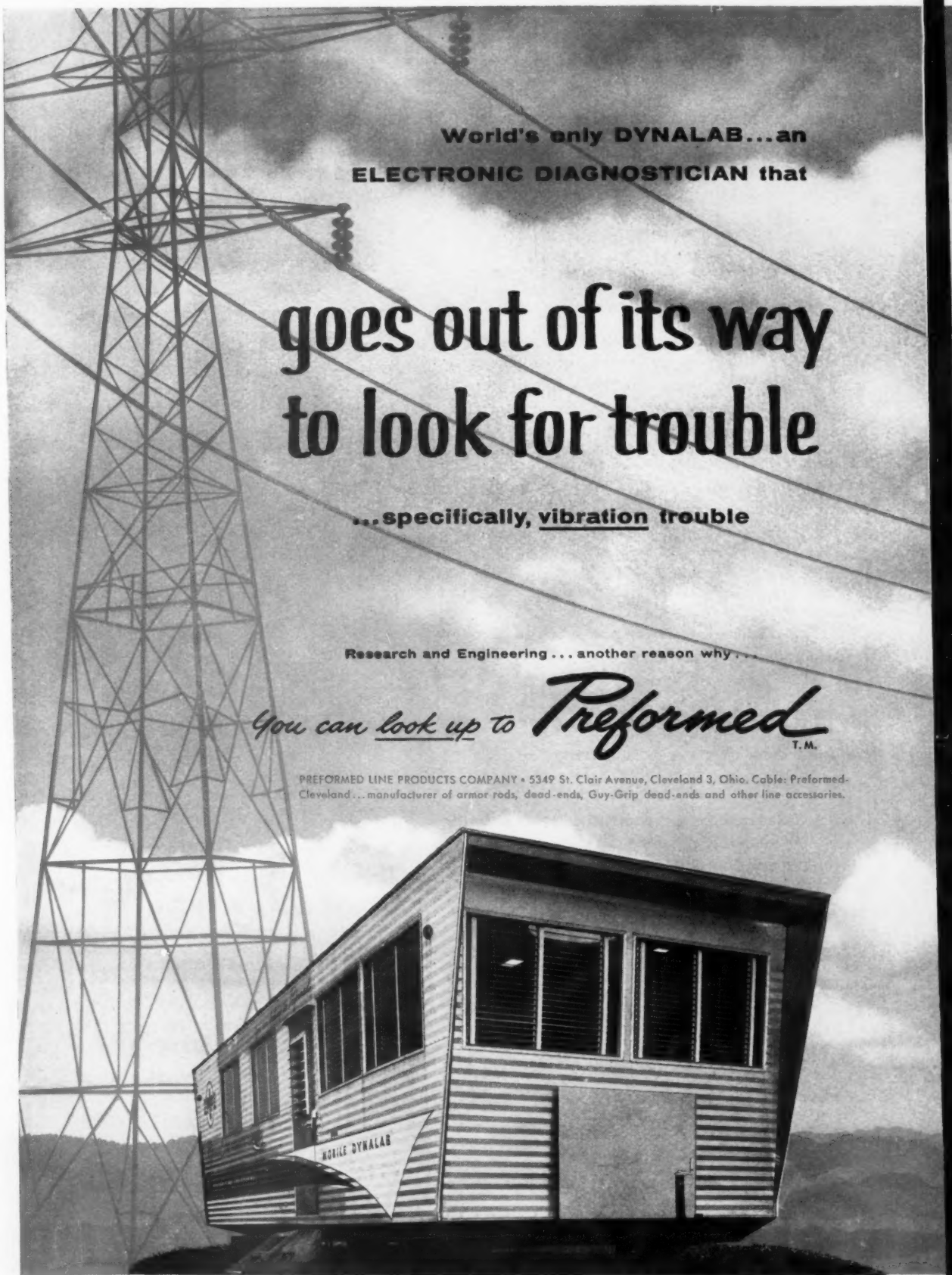
Please send your free booklet containing full details about AAAC.

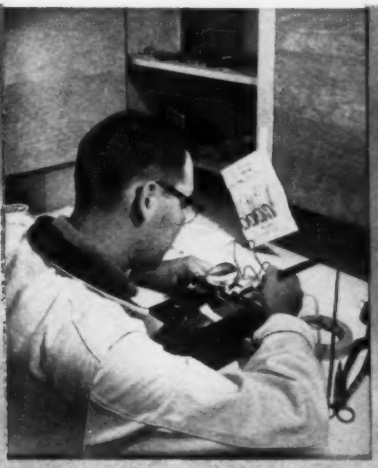
Name_____

Address_____

City_____ State_____

E. WE.


World's only DYNALAB...an
ELECTRONIC DIAGNOSTICIAN that
goes out of its way
to look for trouble
...specifically, vibration trouble
Research and Engineering . . . another reason why . . .
You can look up to Preformed T.M.
PREFORMED LINE PRODUCTS COMPANY • 5349 St. Clair Avenue, Cleveland 3, Ohio. Cable: Preformed-Cleveland . . . manufacturer of armor rods, dead-ends, Guy-Grip dead-ends and other line accessories.
MOBILE DYNALAB



No. 3 of a series...

Vibration of overhead lines still represents a major problem to the utility industry. Although significant improvements in hardware design and construction practices have been brought about through expanded research efforts, the incipient hazard of conductor failures due to fatigue and abrasive wear is becoming an increasingly important problem as the size and cost of transmission line construction continue to increase.

Laboratory vibration research has steadily progressed and has recently been accelerated by the expansion of vibration test facilities and refinement of instrumentation and testing techniques. Field measurement techniques, however, have not kept pace with laboratory advances. Therefore, relatively little quantitative data is available from field investigations for extension of laboratory studies. A few outdoor test spans and isolated field measurements have provided only sparse and often inconsistent results due largely to lack of coordination of these projects and inadequate instrumentation techniques.

The mobile vibration laboratory (Dynalab) recently completed by Preformed Research and Engineering was created by a select team of vibration engineers and electronics specialists to fulfill this need in the practical solution of line vibration problems. Operational requirements were painstakingly studied in cooperation with leading utility engineers. Radical design departures were necessary to overcome the unique problems of instrumenting and monitoring energized EHV transmission lines. A special trailer was designed to provide the high degree of mobility required to obtain data from a variety of geographical regions and remote locations throughout the country.

Already in field service, the Dynalab not only represents a significant scientific advancement in obtaining vitally important field vibration knowledge but also exemplifies the progress possible through an integrated utility-manufacturer team approach to such important and complex industry problems.

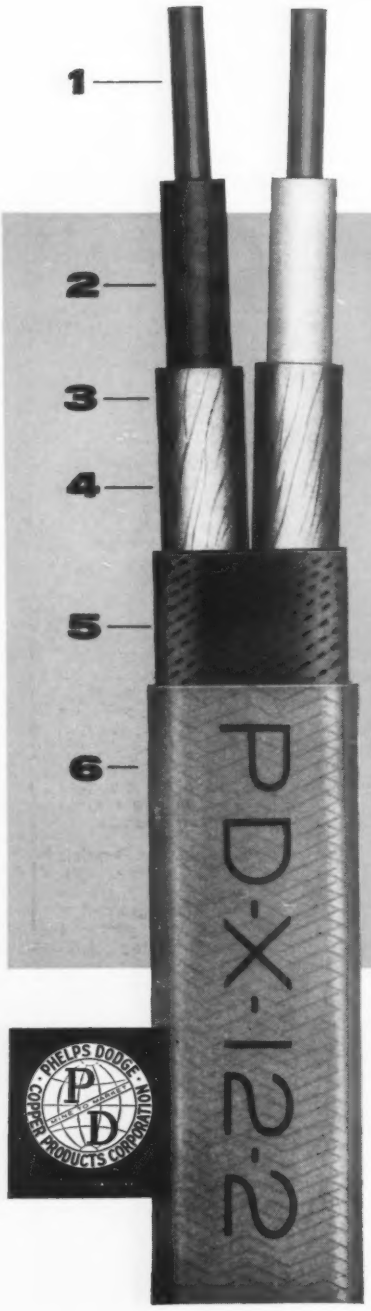
Jon Ruhlman

Jon R. Ruhlman, Vice President
Research and Engineering
Preformed Line Products Company

PLP 10 YEARS OF

Contractors agree...

You can't beat Phelps Dodge Dependable PD-X Cable for fast, easy stripping!



Habirshaw type NM nonmetallic-sheathed cable saves vital on-the-job time and money!

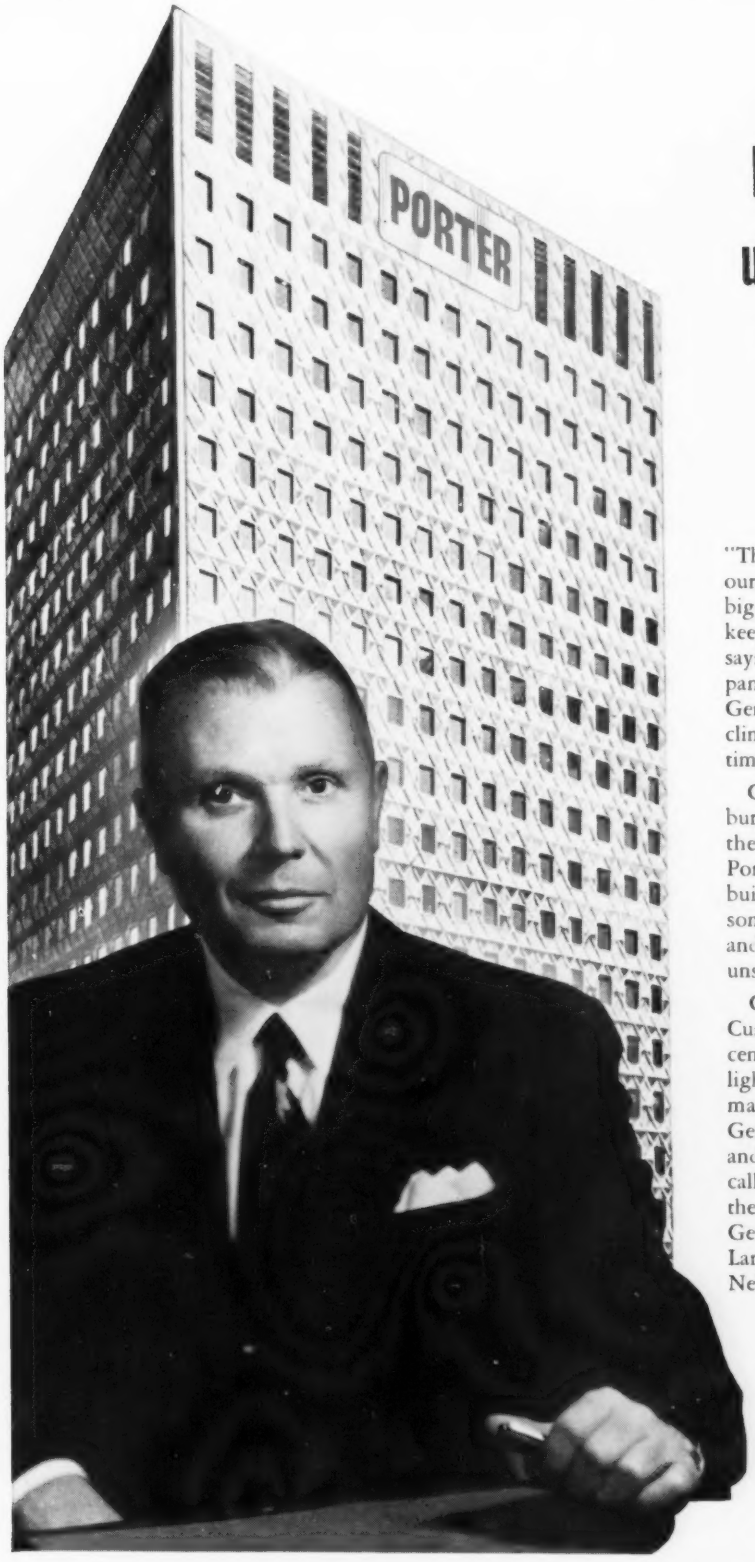
Phelps Dodge Copper Products Corporation's PD-X cable is the fastest-stripping, cleanest-working nonmetallic-sheathed cable on the market today. Here's why:

1. Copper conductors are *soft* drawn. Connections are easily and quickly made.
2. Habirdure Thermoplastic Insulation is clean and smooth —makes stripping *simple, easy,* fast.
3. Paper armor is resin-treated to resist moisture, is clean and dry—no oil, grease or wax is used.
4. Paper armor is applied with a long twist and can be removed by an easy flick of the fingers. No time-wasting unwinding, no sticking to underlying insulation.
5. Barrier tape keeps finishing compounds out of the cable —leaves inside clean and free of gum. *Strips off cleanly as a unit with outer braid covering.*
6. New clean, grey finish eliminates sticking, *assures easy pulling,* clean walls and hands.

See Your Phelps Dodge Distributor!

PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Detroit, Fort Wayne, Greensboro, N.C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N. Y., San Francisco, St. Louis, Seattle, Washington, D.C.



Pittsburgh's New Porter Building uses General Electric fluorescent lamps for economy

"The lamps themselves are only a small part of our over-all lighting costs, so we look for the big economies that come with the lamps that keep our total lighting costs to a minimum," says T. M. Evans, Chairman, H. K. Porter Company, Inc. "In addition to these economies, General Electric fluorescent lamps contribute to climate control which creates 'eternal springtime' in the new Porter building."

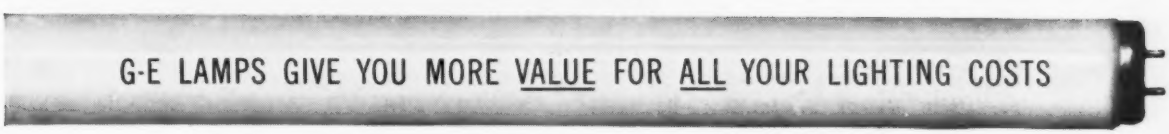
Conveniently located in the heart of Pittsburgh's business district across the street from the city's two major hotels the sixteen-story Porter building was erected faster than any other building of its kind in the city. It is tenanted by some of the best names in American industry, and has modern, up-to-date office space that is unsurpassed in Pittsburgh.

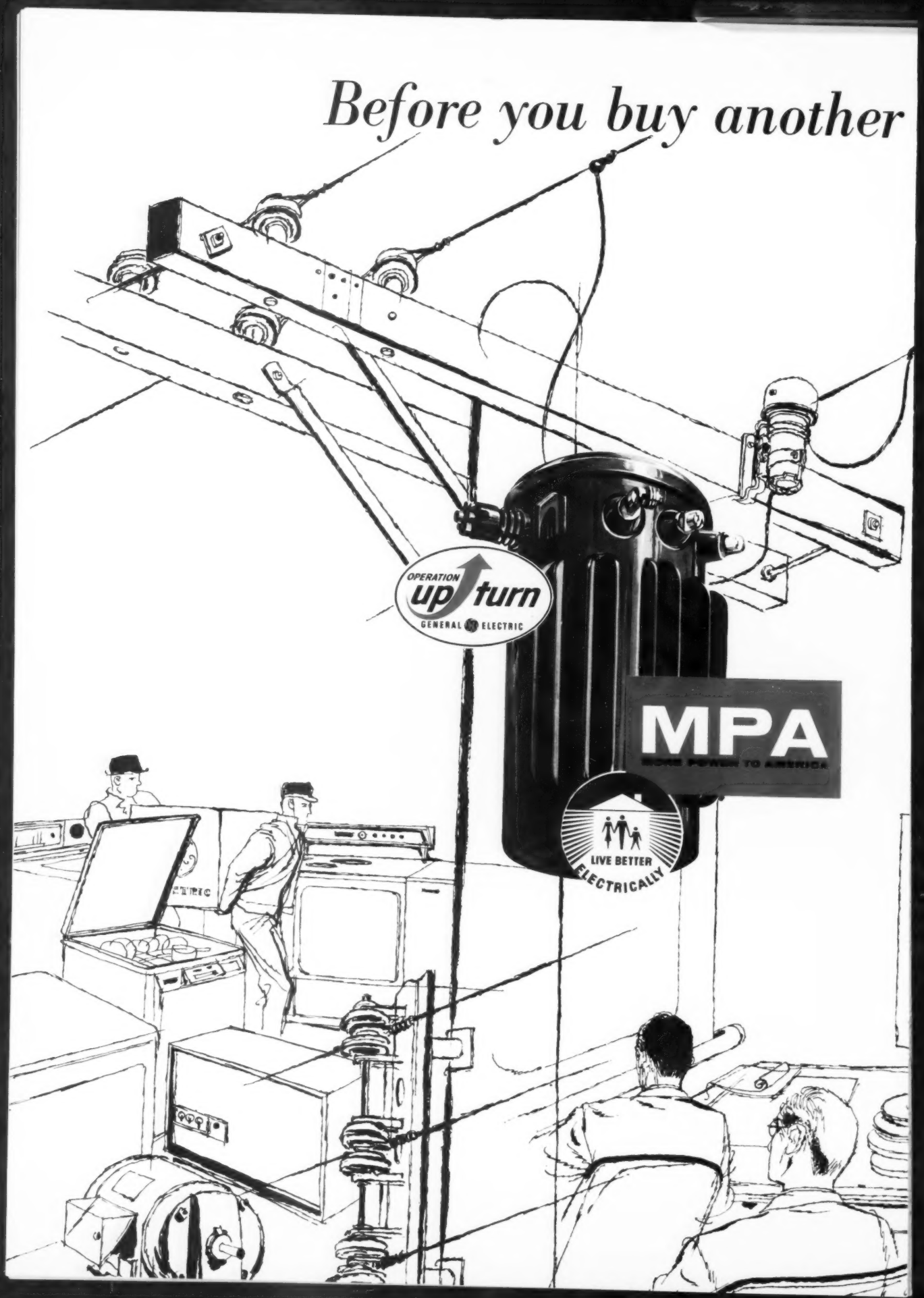
G-E Lamps are giving Porter extra value, too. Customers who have used G-E 40-watt fluorescents exclusively are getting 38 per cent more light today than they did in 1950 because of the many improvements that slip quietly into General Electric Lamps to improve light output and keep lighting systems up-to-date automatically. Call your local G-E representative and get the whole story. Or write: General Electric Company, Large Lamp Dept. C-841, Nela Park, Cleveland 12, O.

OPERATION up turn — Buy now for extra values — GENERAL ELECTRIC

Progress Is Our Most Important Product

GENERAL ELECTRIC




Before you buy another
OPERATION
up turn
GENERAL ELECTRIC
MPA
LIVE BETTER
ELECTRICALLY

transformer... MEASURE LOAD BUILDING

General Electric programs and products put load on your line

For every distribution transformer you purchase from General Electric, almost a dollar is invested in More Power to America, Live Better Electrically, Operation Upturn, and in other industry-wide load-building and adequate-wiring programs.

General Electric sells two dollars' worth of equipment to *consume* electric power for every dollar's worth sold to *produce* electric power. And you get the load built by these power-consuming products, ranging from home appliances to giant furnaces for industry. So General Electric products as well as programs build load.

Before you buy another distribution transformer, measure load-building activity—give your transformer manufacturer credit for the extra values he gives you. General Electric Company, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

GIVE YOUR TRANSFORMER MANUFACTURER CREDIT FOR THE EXTRA VALUES HE GIVES YOU		G.E.	OTHER MFGRS.			
MEASURE LOAD BUILDING—do Co.'s other products build load? Does Co. sponsor load-building programs?						
CHECK SERVICE—24-hour shipment? repair and uprating? emergency assistance?						
COMPARE FEATURES—how many exclusive features in terms of longer life; reliability; easy maintenance?						
ANALYZE PRICE—does Co. hold line against inflation with significant product developments?						
EVALUATE INNOVATIONS—has Co.'s research paid off for you? Recent examples?						

FILL IN THE BLANKS . . . See which manufacturer gives you more for your transformer dollar: Mark "X" for a measurable contribution, "O" for insignificant contribution.

Underground distribution system savings begin the day you decide to install J-M Transite Ducts. You can figure on lower operating costs, prolonged insulation life, more reliable service and longer cable life.

J-M Transite Ducts permanently resist fire and arc... provide lifelong dependability, many operating economies

GONE ARE MANY of the headaches of transmitting heavy electrical loads underground, when you protect cables with Johns-Manville Transite® Ducts. They assure you of greatest protective value, and maximum load capacity, per dollar invested.

And when cable fire or failure occurs, noncombustible Transite Ducts remain undamaged and can be used again for the new lines. Regardless of conditions, Transite Ducts provide permanent service as they do not deteriorate from heat, water or corrosive soils.

Tests have shown that Transite-protected cables run cooler under given loads . . . carry greater loads at given temperatures because Transite helps dissipate heat faster. And for lower operating costs, consider the long-range value of Transite Ducts in terms of (1) increased insulation life, (2) fewer cable failures, and (3) lower I^2R losses for the full working life of a system.

For details on Transite Ducts' many advantages, distribution engineers are invited to write for informative brochure EL-29A. Johns-Manville, Box 14, New York 16, N.Y. In Canada, 565 Lakeshore Road East, Port Credit, Ont.

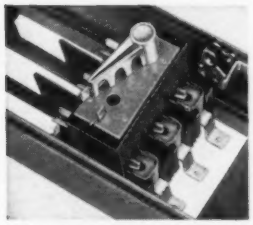
JOHNS-MANVILLE

JOHNS MANVILLE JM PRODUCTS

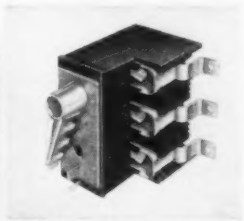
Now QMQB Fusible Switches

- **QUICK-MAKE, QUICK-BREAK**
- **30 THROUGH 1200 AMPS**
- **VISIBLE BLADE CONSTRUCTION**

FOR PANELBOARDS, SWITCHBOARDS, CONTROL CENTERS—heavy-duty design meets modern industry's increased power handling requirements—30 through 1200 amperes, 600 volts—the most complete line available! U.L. approved. For complete information on QMQB units and panelboards, write for bulletin 3-230: Federal Pacific Electric Company, General Offices: Newark, New Jersey.



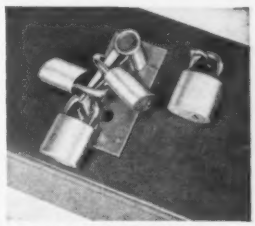
VISIBLE BLADES FOR MAXIMUM SAFETY—Lets you see at a glance whether switch is "ON" or "OFF"—makes inspection easy. Silver-alloy contacts insure positive connections—reduce wattage loss.



INTEGRAL HANDLE MECHANISM FOR GREATER CONVENIENCE—handle mechanism and switch are combined in a single unit—eliminates excess linkage—prevents misalignment and false indication of switch position.

DEIONIZING ARC QUENCHERS FOR COOLER, FASTER INTERRUPTION—eliminate pitting and provide higher interrupting ability. Arc is divided, cooled, and extinguished in the quencher, rather than on the contact surfaces.

HIGH PRESSURE FUSE HOLDERS FOR LONG LIFE, RELIABLE SERVICE—grip the fuses tightly under constant spring pressure—reducing contact resistance for cooler, more efficient switch operation—even under varying loads.



LOCKING PROVISION FOR ADDED SAFETY—cover may be locked in either "ON" or "OFF" position with as many as three full-size padlocks to prevent unauthorized access. Additional provision for padlocking cover.

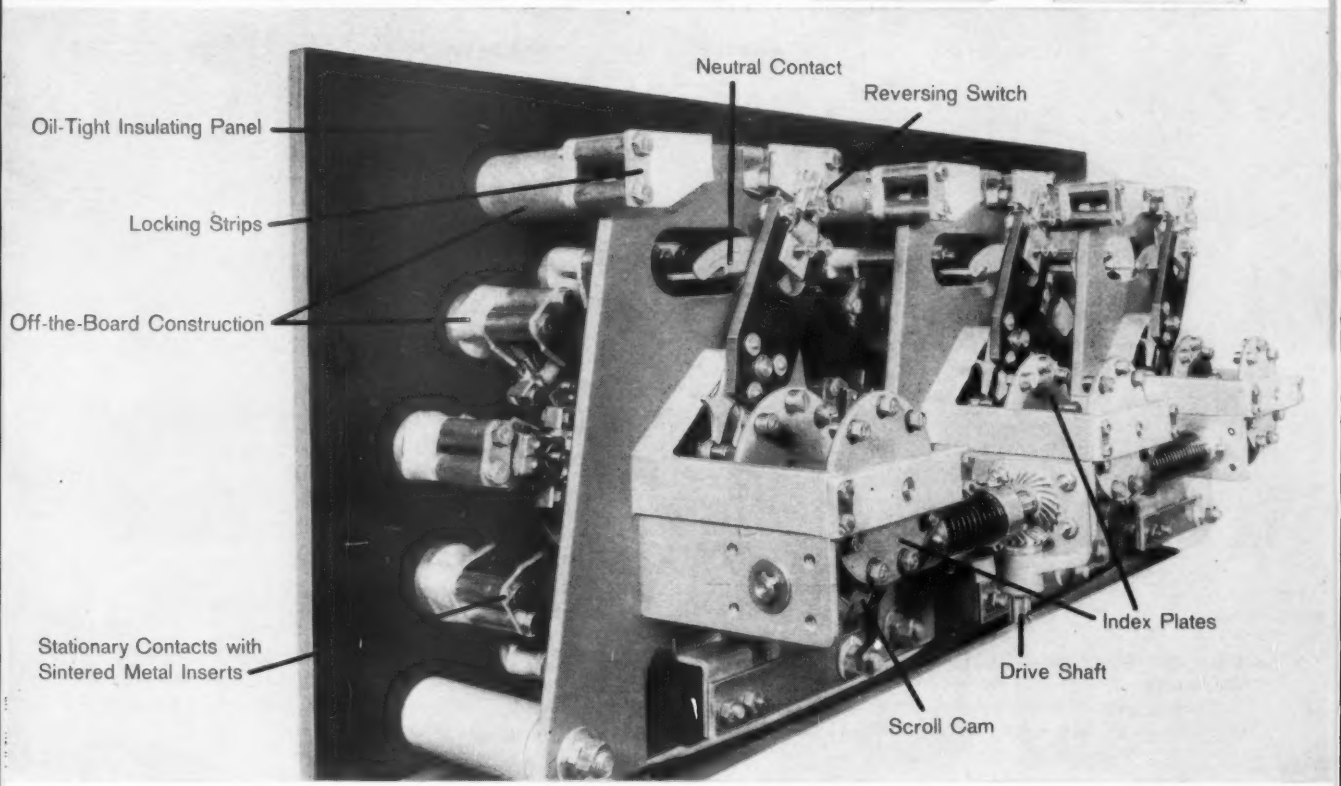
FEDERAL FPE PACIFIC

The Best in Electrical Distribution and Control Equipment

It's a matter of Cause and Effect . . .

CAUSE

The "550" – a new and better Load Tap Changing Mechanism that can be made for less money.



The development of an entirely new underload tap changer is vital electrical news at any time. But the reduction in the price of the electrical equipment as a direct result of a new and improved design is of *special* significance at this particular time. It is hoped that the combination of these two events will stimulate the purchase of load tap changing transformers in ratings 10,000 kva and smaller.

The facts are simply these: Pennsylvania Transformer engineers have developed, completely tested, and approved an entirely new load tap changing mechanism. Designed around the *direct-drive* principle, it results in a *much simpler,* but at the same, time, a *much more rugged* mechanism that can be manufactured at a lower cost than former spring-drive units. Savings to the user are substantial—averaging between 10 and 15 per cent.

This price reduction presents Electric Utilities with an unusual opportunity to improve service to their customers by purchasing load tap changing transformers more economically and installing them for better system regulation. Referred to as the "550," Pennsylvania's new LTC mechanism has been designed for application on all three-phase, LTC transformers covered by ASA standard C57.12A, on special transformers in equivalent sizes, and in equivalent step voltage regulators.

Qualified sales engineers of Pennsylvania Transformer are alerted to discuss the particular needs of your utility at your own convenience. For appointment write, phone or wire: Pennsylvania Transformer Division, McGraw-Edison Co., Box 330, Canonsburg, Pa. Phone: SHerwood 5-9100.

McGRAW EDISON

PENNSYLVANIA POWER

Pennsylvania announces lower prices on tap changing transformers in ratings 10,000 kva and smaller.

In the design of Pennsylvania's new Type 550 LTC Mechanism, maximum consideration was given to the following:

1. Positive indexing with mechanical interlocking

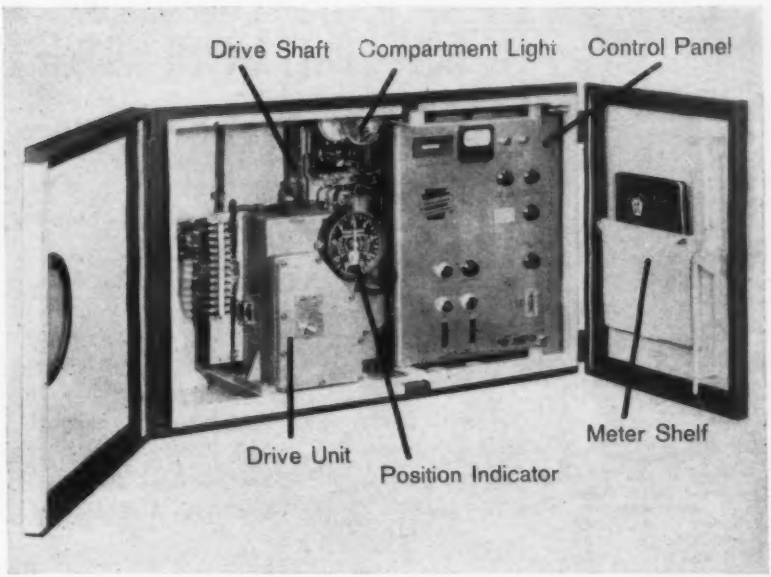
Direct drive of contacts through a scroll cam and index plates inherently insures positive mechanical interlocking. Although the stopping position of the drive is not critical, DC braking of the drive motor is provided to make sure that the contacts stop in the exact position.

2. Efficient arc interruption through controlled contact speed

The movable contacts *start slowly, accelerate rapidly* during interruption, and *close gently* without contact bounce or excessive mechanical shock. This contact speed control is obtained through coordination of the scroll cam design with the design of the gear train.

3. Maximum mechanical life – minimum maintenance

This sturdy mechanism has successfully passed mechanical life tests in excess of two million operations. Particular attention has been given to providing all bolted connections with locking devices.



4. Maximum electrical life – minimum maintenance

All fixed conducting parts in the mechanism are sturdy studs or bus bars rigidly locked in position. Moving contact pressures are individually controlled by coil springs in compression; and rolled copper shunts carry current away from moving contacts. Stand off insulators raise current-carrying parts from high dielectric strength "Pennsylite" to reduce dielectric stress panel on surfaces.

5. Ease of inspection, maintenance and assembly

Hinged doors are provided for air-filled drive/control compartments and oil-filled arc tap switch compartment. Drive and switch compartments consist of subassemblies that are relatively easy to remove and replace.

6. Adaptability to various types of local or remote controls

This includes provisions for hand cranking, automatic control, mounting transmitting unit of remote indicating system, and mounting cam operated auxiliary switches for out-of-step and parallel operation, etc.

7. Positive oil seals

All gasketed joints in the oil-filled compartment are made by completely retained synthetic rubber gaskets. This includes seal between main barrier panel and main tank, all conductor studs which pass through the main barrier panel, and joints at doors of arcing tap switch.

NEW "550" LTC MECHANISM 50% SMALLER AND 75% LIGHTER IN WEIGHT

A comparison of the new 550 mechanism with the unit it replaces shows that in total volume, the "550" is half as large as the former unit. But an even greater difference shows up in total weight. The "550" including oil, weighs only 25% as much as the old unit.

TRANSFORMERS

THE LINE WITH THE GOLDEN TOUCH

Residential Outdoor Surface Meter Socket

Residential Indoor Surface Meter Socket

A COMPLETE LINE OF HEAVY DUTY METER MOUNTING DEVICES

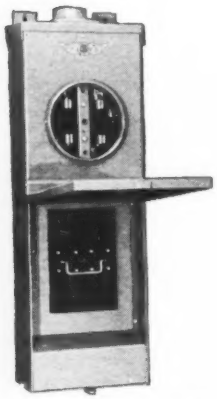
What we mean by The Line With The Golden Touch

These devices were designed by a former electrical contractor with these ideals in mind:

- **Installability**
- **Quality**
- **Delivery Service**
- **Complete Line**
- **Good Looks**
- **Fair Play for Jobbers and Electrical Contractors**

We are showing just a portion of our 200 Amp Line here. Write for free literature.

Commercial Outdoor Surface Safety Socket With Fusable Disconnect



Residential Outdoor Surface Pullout

Commercial Outdoor Surface Manual Circuit Closing

Commercial Flush Safety Socket

Commercial Outdoor Surface Manual Circuit Closing With Fusable Disconnect

Watch for opening of new offices in San Francisco, Portland, Phoenix, and Honolulu

BLAKEMAN ELECTRIC LOS ANGELES — BB — BROTHERS MFG. CO. INC. CALIFORNIA

5859 Compton Ave.
Los Angeles 1, Calif.
LUdlow 1-8231

Contact Your Jobber
Meter Mounting Devices • That's All

DEAD END WITH

BLACKBURN

W6-2A from 6 Sol to 2 ACSR
This Clamp Will Handle All
Popular Service Drop Wires

WEDGE CLAMPS

For Light Service
W6-4A
6 Sol to 4 ACSR

For Heavy Service
W2-OA
2 Sol to 1/0 ACSR

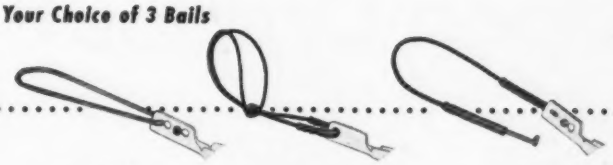
Conductor in contact with wedge for entire length of slider.

Removable aluminum slider allows installation without threading through clamp.

Drop wire can be pre-sagged and cut to exact length needed.

Can be attached to bare neutral at any point in the span.

Your Choice of 3 Bails

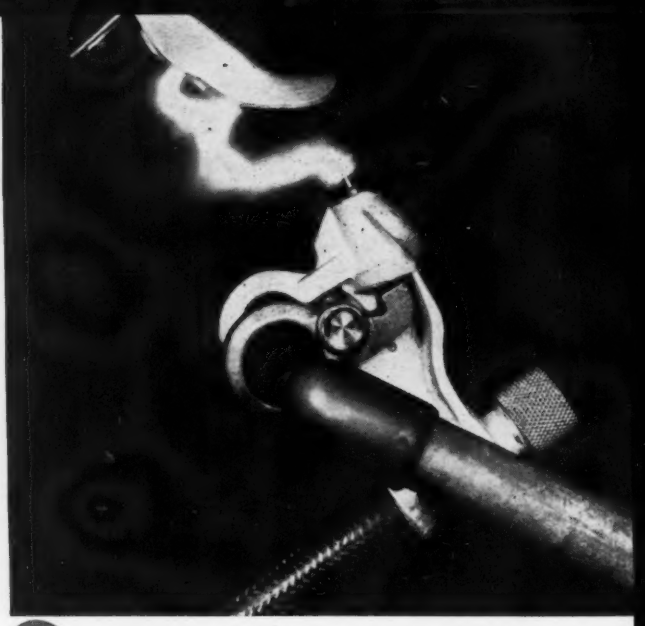


STANDARD FLEXIBLE CAPTURED FLEXIBLE FREE

JASPER
BLACKBURN
CORPORATION

1525 WOODSON RD., ST. LOUIS 14, MO., WYdown 3-9430

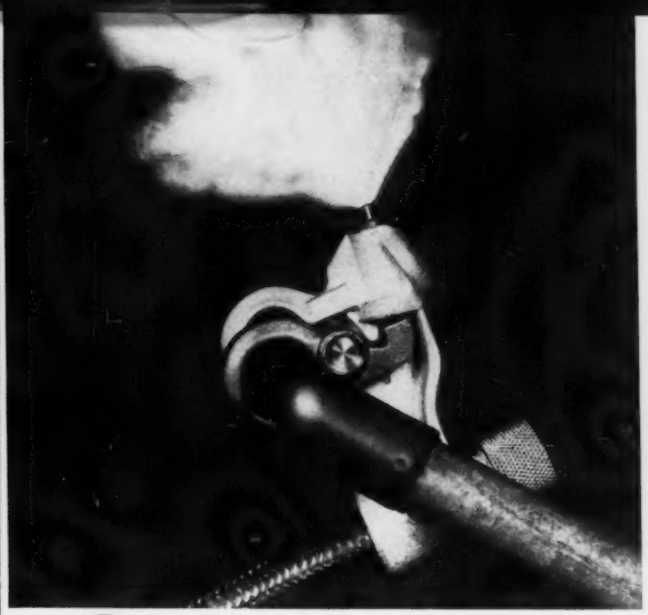
1. ALWAYS READY and unaffected by weather conditions, a conventional switchstick is all that's required to "break load" with this revolutionary device.



2. ARC IS DRAWN between top contact of the cutout and tip of monel gas cylinder. Load break operations have no effect on the normal function of the cutout.

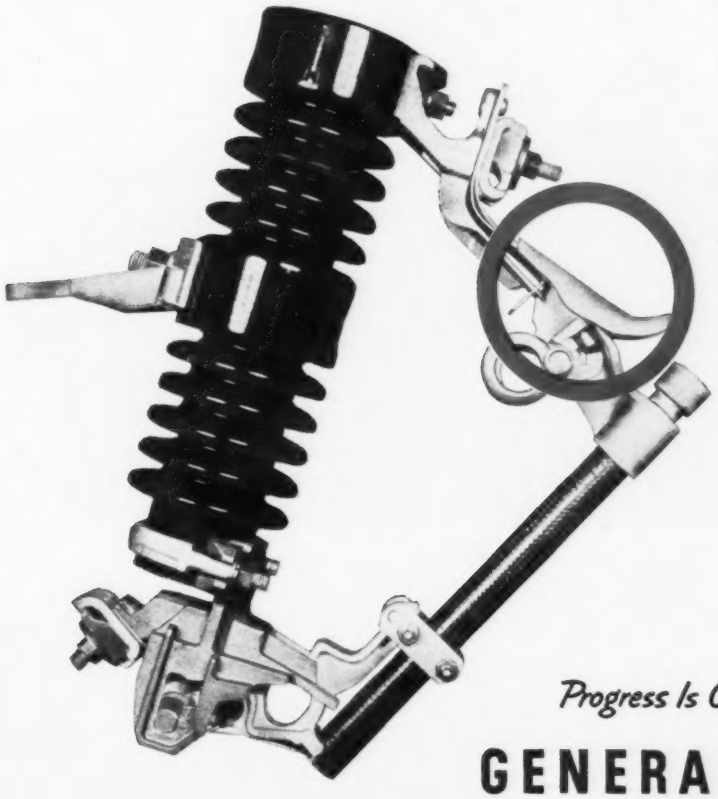
Now you can open circuits safely under full rated load with the General Electric Open Dropout Cutout's

Revolutionary



3. **ARC MELTS TIP** of the monel gas cylinder releasing blast of insulating gas. This new device makes opening under full load safer and easier for your lineman.

4. **ARC IS OUT** automatically within two cycles at full load. The circuit is now open. Fuseholder can be removed and cylinder replaced in seconds.

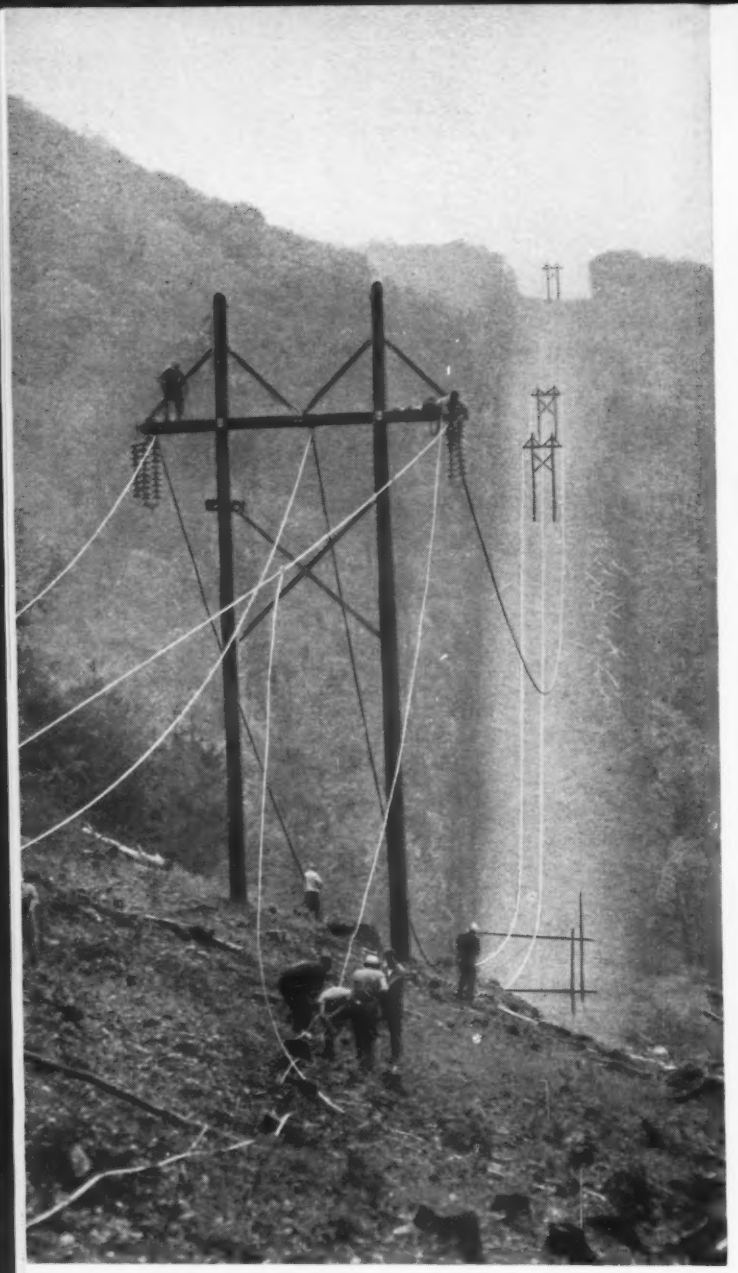


The General Electric gas-operated load break is a revolutionary advance in cutout design. It permits opening of circuits under full load safely and quickly with conventional inexpensive switchsticks. Proved successful in service on the G-E enclosed cutout, the high pressure blast of insulating gas blows the arc out automatically within 2 cycles at full rated load . . . providing very **low-cost switching.** Gas load break is available in the 7.8 and 15 kv ratings including the disconnect blade. The new gas load break fuseholder will fit all modern G-E open dropout cutouts. You'll want to know more about this device. Contact your nearest G-E Apparatus Sales Office, or write to the General Electric Company, Section 435-17, Schenectady 5, New York.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Load Break



When a job calls for ACSR ...it calls for Anaconda cable experience

Producing top quality transmission cable requires more than a ready supply of metal—copper or aluminum. The most vital ingredient of good cable is the manufacturer's *cable experience.*

The choice of metals may change, depending on economic or other considerations. But cable requirements and the skills and knowledge involved in making dependable transmission lines do not. Whether copper or aluminum . . . it will pay you to call on the Man from Anaconda.

Backed by the broadest line of wire and cable in the industry, in both copper and aluminum, he is best qualified to help you arrive at the most practical and economical answer to your cable needs.

Multi-mill manufacturing facilities – strategically located across the country – assure speedy service. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

FASTEST WESTERN SERVICE – At Orange, California, Anaconda's expanded, modernized mill fabricates and stocks copper and aluminum wire and cable for *every type of application.* Anaconda's Western Distributors thus can assure the fastest possible service on all West Coast needs. See Anaconda Sales Offices: Los Angeles, San Francisco, Seattle, Denver.

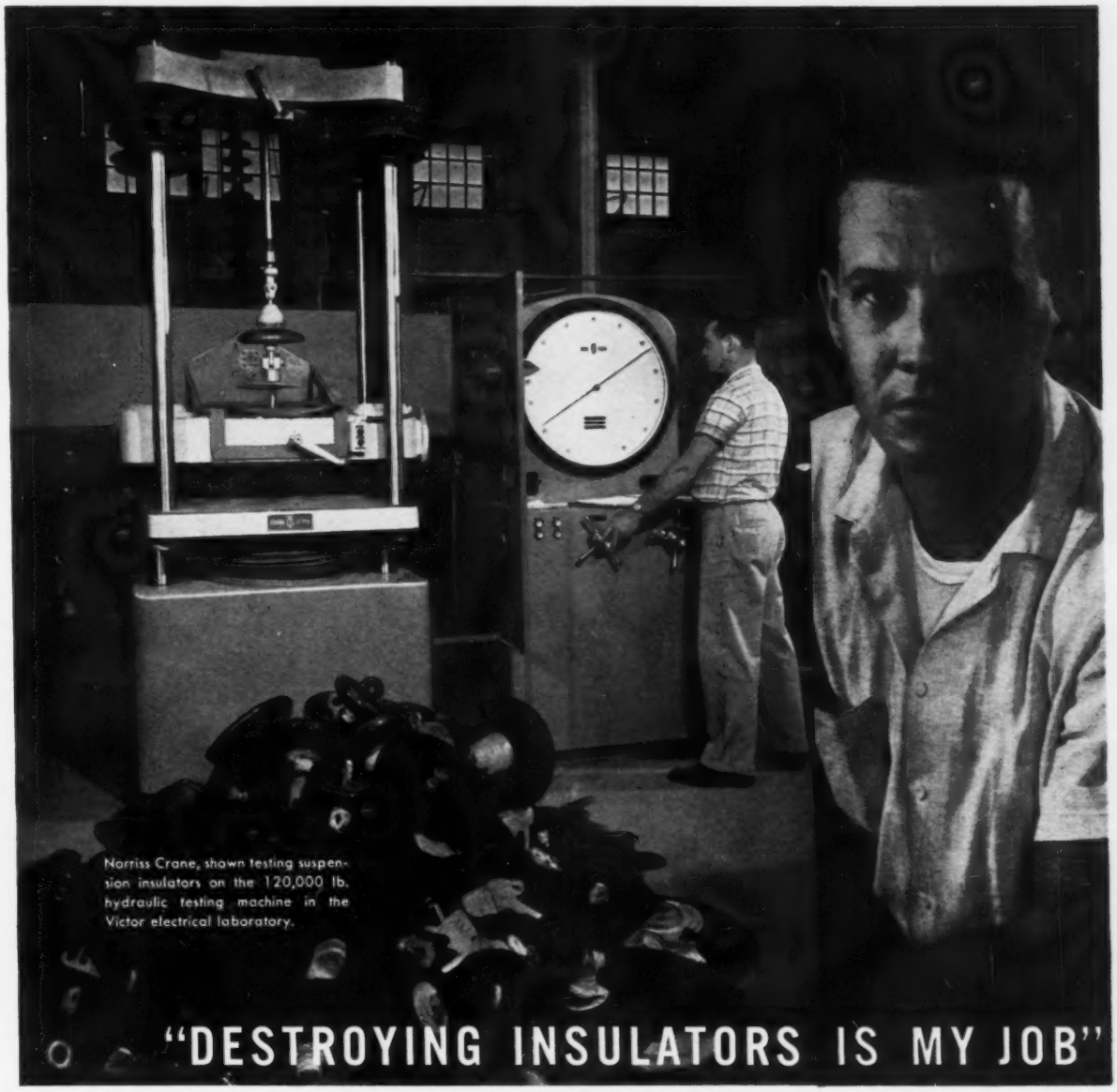
SEE THE MAN FROM ANACONDA®
FOR ALUMINUM WIRE AND CABLE

HIGHWAY FOR POWER. Anaconda 336.4 Mcm ACSR installed through rugged Catskill Mountains by New York State Electric & Gas Corporation.

LINEMAN *(below),* standing near slowly revolving reels of cable, uses sound-powered phone to talk to cable-pulling crew about one-half mile away.

BULLDOZER *(lower left)* pulls cable from 4 or 5 reels up and over 5 pole dead end and on to the next H structure. "Cat" had to let itself down mountainside by winch.

57387


Norriss Crane, shown testing suspension insulators on the 120,000 lb. hydraulic testing machine in the Victor electrical laboratory.
"DESTROYING INSULATORS IS MY JOB"

Says Norriss Crane, Chief Test Engineer, Victor Insulators Division, I-T-E Circuit Breaker Company

"The VICTOR insulators that go on your lines will never have to take the mechanical and electrical loading we give them in the VICTOR laboratory. Here, these insulators are subjected to stresses far in excess of the EEI-NEMA Standards. In fact, our continuous quality control testing program shows that VICTOR insulators proof-test at values as much as twice their EEI-NEMA ratings. Such a margin of safety precludes insulator failure on the line."

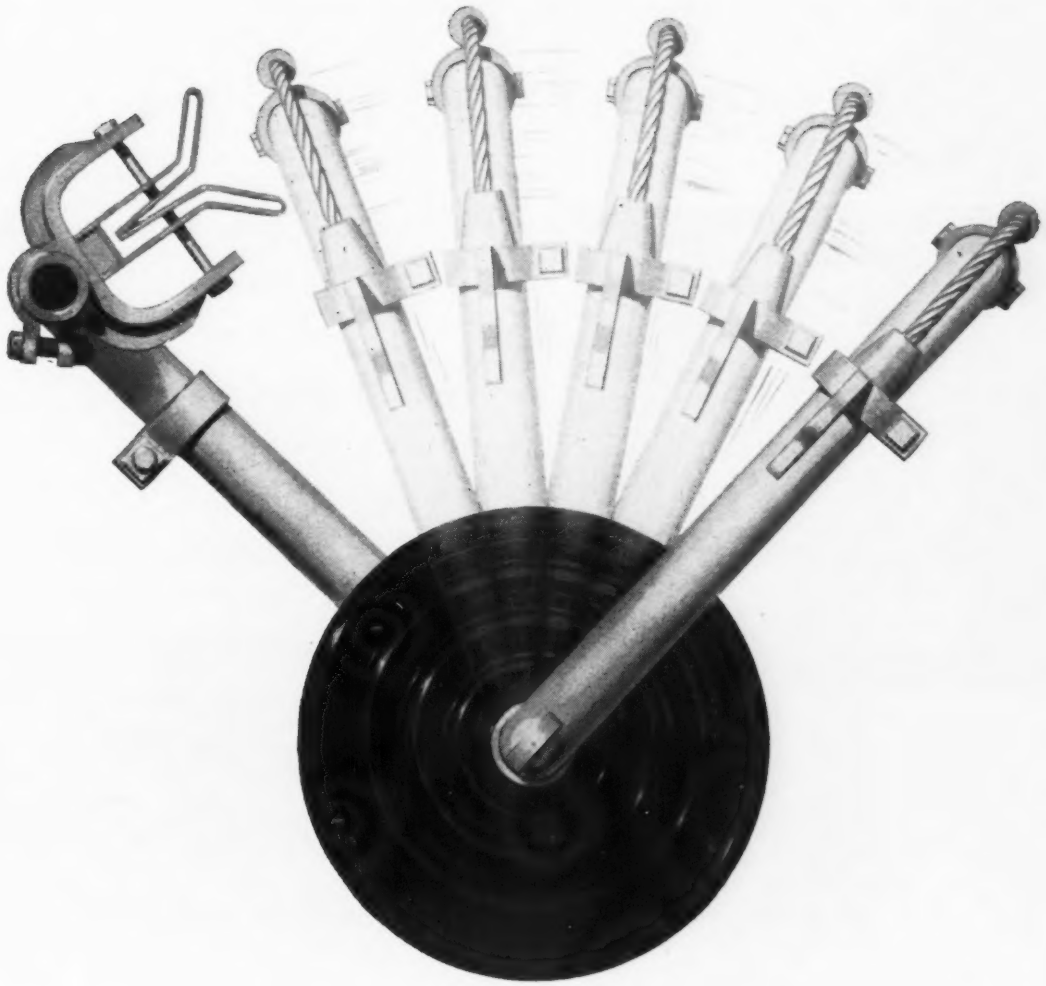
When you buy VICTOR, you buy practically twice the insulator you pay for. That's why we say: "*VICTOR is the power man's best bargain.*"

I-T-E CIRCUIT BREAKER COMPANY, INC.
VICTOR INSULATORS DIVISION
Victor, New York

This "look" means KPF

Simple design means pleasing pole top appearance, and pleasing all-weather performance. KPF switches have no complex mechanisms to freeze, lock, need lubrication or repair. They cost less, install in half the normal time, can be installed on the ground, or on "hot" lines. No extra dead end insulators or extra mounting structures are required.

Major utilities have used KPF switches for 50 years. Why not discover their unique advantages yourself, with a test installation on your system. This month!



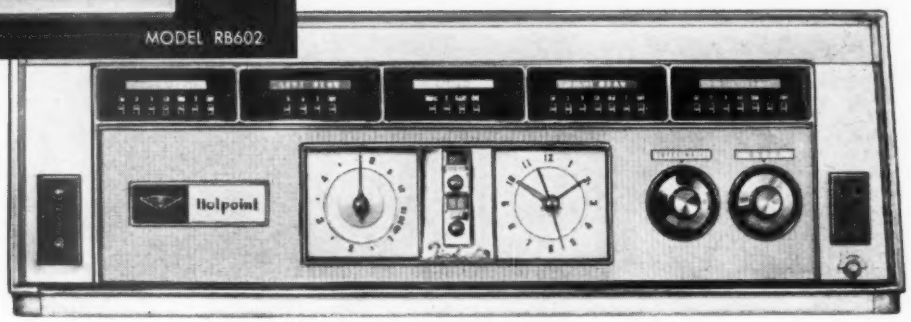
KPF ELECTRIC COMPANY
Dept. W, 1624 E. Alpine Avenue
Stockton 5, California

KPF
AIR BREAK
SWITCHES
Standard for half a century

PUT FULL HOUSEPOWER TO WORK

1959 Hotpoint ELECTRIC RANGES

have the Difference that builds load and revenue... automatically!

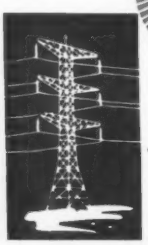


Hotpoint Electric Ranges help you build sales, load and revenue with all of the brilliant advances in quality, styling and completely automatic operation that make up the Hotpoint Difference.

For example, the distinctive new control panel above provides truly automatic cooking. There's an optional Custom Cooker and Server that doubles as a casserole when used in the oven or as a fully automatic utensil when used on the Super-Matic unit. The oven is full width, with a high speed Calrod® bake unit, plus an automatic Rota-Grill rotisserie that easily holds an 18-pound ham.

These imaginative, yet practical advantages are just a few samples of the sale-exciting features offered by the dramatic Hotpoint Difference. Hotpoint Ranges will help you put more POWER in "Housepower"—more LIVING in "Live Better—Electrically!"

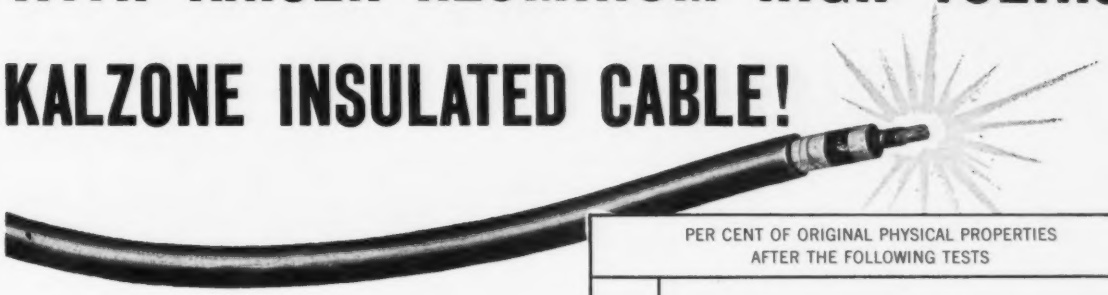
LIVE BETTER ELECTRICALLY



LOOK FOR THAT Hotpoint DIFFERENCE

(your customers do!)

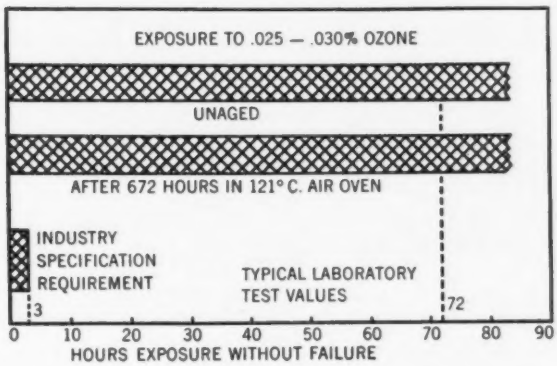
10 TIMES MORE INSULATION RESISTANCE WITH KAISER ALUMINUM HIGH VOLTAGE KALZONE INSULATED CABLE!



A year-long analysis of 393 full-length reels of Kaiser Aluminum Kalzone insulated cable showed that more than 93% of the lengths tested exceeded an insulation resistance constant "K" of 100,000 ... ten times greater than current IPCEA requirements of 10,000!

More than 5% of the balance tested exceeded a 50,000 "K," and ¾ of 1% fell between 25,000 and 50,000.

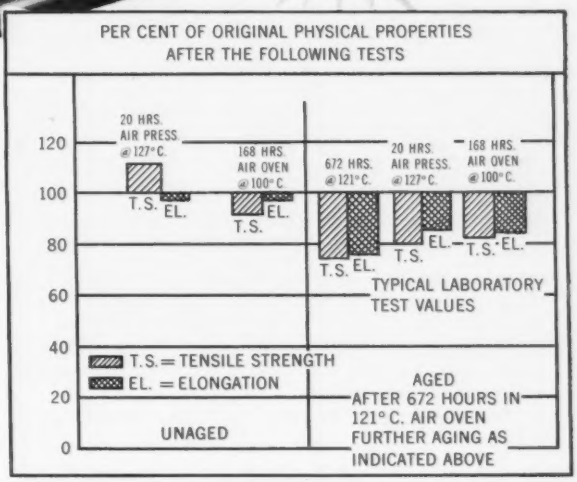
Laboratory tests prove Kalzone provides best protection against ozone, heat, moisture


EXPOSURE TO .025 — .030% OZONE
UNAGED
AFTER 672 HOURS IN 121° C. AIR OVEN
INDUSTRY SPECIFICATION REQUIREMENT
TYPICAL LABORATORY TEST VALUES
3
72
0 10 20 30 40 50 60 70 80 90
HOURS EXPOSURE WITHOUT FAILURE

OZONE RESISTANCE

Unaged—Withstands more than 72 hours in .025–.030% ozone without failure.

Aged—Still withstands more than 72 hours in .025–.030% ozone without failure after 672 hours in a 121° C. Air Oven.



HEAT RESISTANCE

Unaged—Practically unaffected by Air Pressure or Air Oven Tests.

Aged—Actually improves in per cent of original tensile strength and elongation in Air Pressure and Air Oven Tests, after 672 hours in 121° C. Air Oven.

MOISTURE RESISTANCE

MECHANICAL

Unaged—Less than 5 milligrams absorption in standard Gravimetric 7-day Test. (IPCEA, 15 mgms.)

Aged—After 672 hours in a 121° C. Air Oven, less than 7 milligrams absorption.

ELECTRICAL

Unaged—Less than 2% increase in Capacity in 1–14 day EM-60 Test. (IPCEA, 5%.)

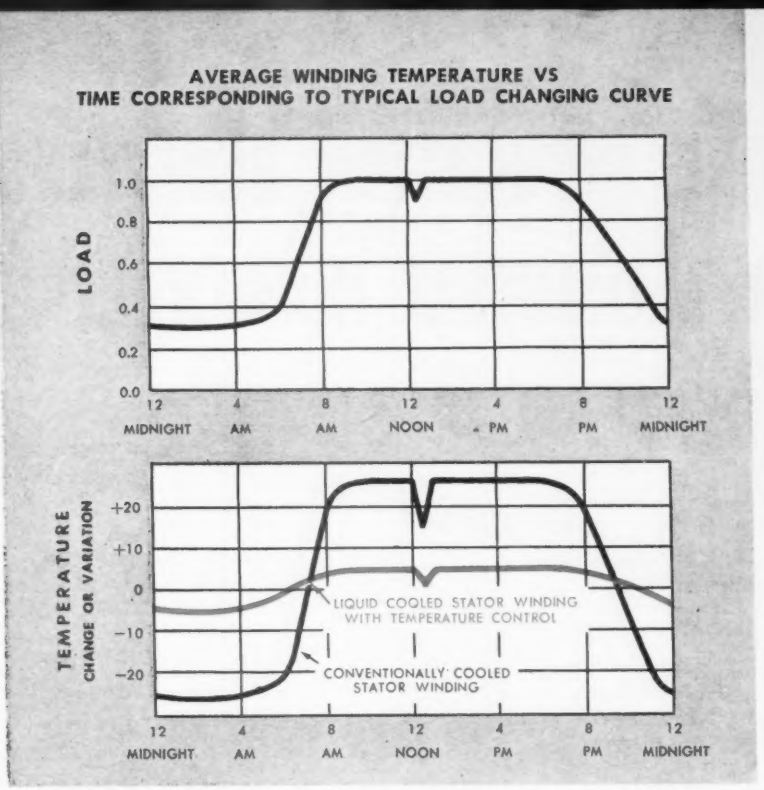
Aged—After 672 hours in a 121° C. Air Oven, less than ½ of 1% increase in capacity in 1–14 day EM-60 Test.

Kaiser Aluminum Kalzone insulated high voltage cable is laboratory tested and quality controlled during actual production to assure *proved quality* with every reel. Get full details on this low cost, lightweight aluminum power cable now. Contact the Kaiser Aluminum sales office listed in your telephone directory.

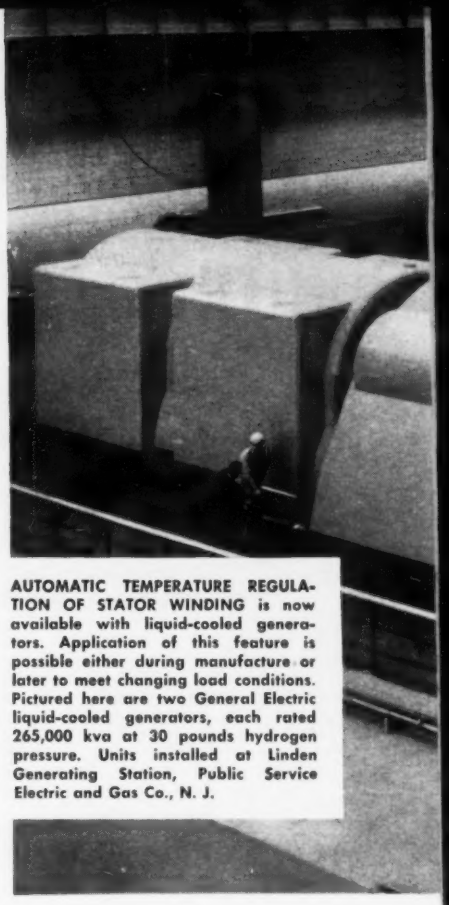
Kaiser Aluminum & Chemical Sales, Inc., 919 N. Michigan Avenue, Chicago 11, Illinois.

KAISER ALUMINUM

IF IT CARRIES CURRENT, K/A CARRIES IT!



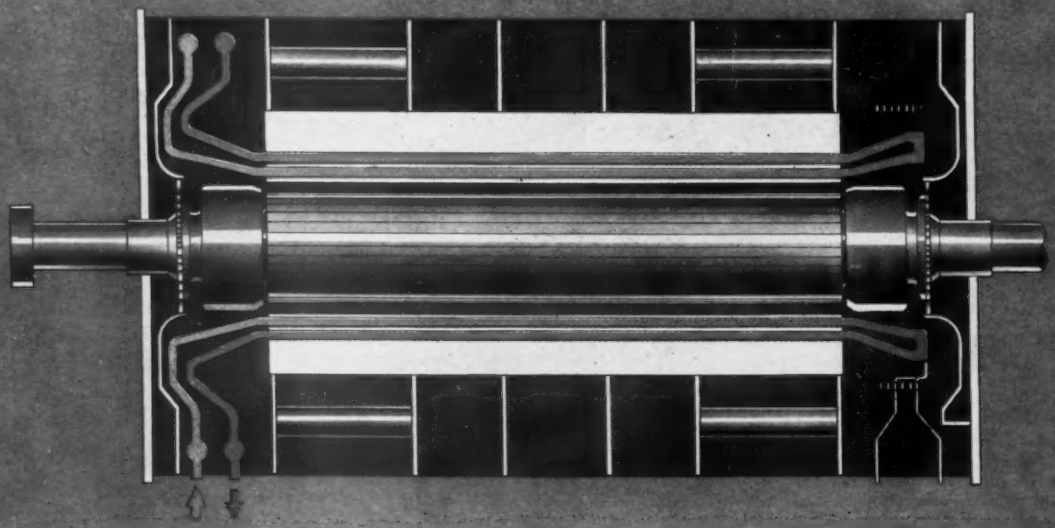
MINIMUM VARIATION OF STATOR TEMPERATURE is possible with liquid cooling, in spite of changes in generator load. Since the liquid coolant is in direct contact with the hollow conductors, the temperature difference between them is only a few degrees. Therefore, by thermostatic control of the coolant, average copper temperature can be kept essentially constant, thus minimizing thermal stress cycling on the insulation.



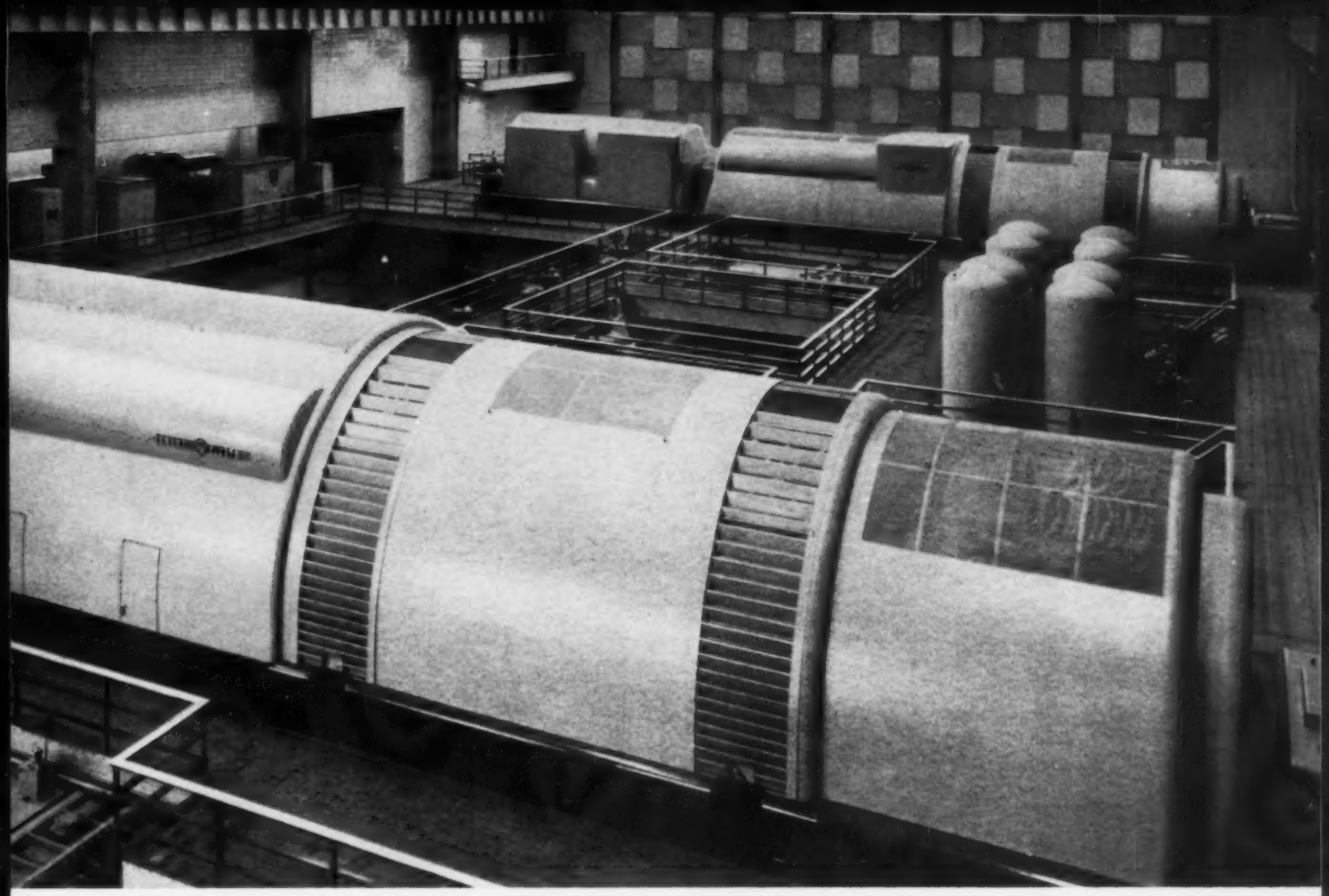
AUTOMATIC TEMPERATURE REGULATION OF STATOR WINDING is now available with liquid-cooled generators. Application of this feature is possible either during manufacture or later to meet changing load conditions. Pictured here are two General Electric liquid-cooled generators, each rated 265,000 kva at 30 pounds hydrogen pressure. Units installed at Linden Generating Station, Public Service Electric and Gas Co., N. J.

WITH HIGHER RATINGS NOW POSSIBLE FOR GENERAL ELECTRIC GENERATORS...

Liquid cooling system permits control of



SIMPLICITY OF THE LIQUID FLOW CIRCUIT adds to reliability. As shown here, highest copper temperature is near the end of the bar, making possible automatic regulation of stator temperature by regulating the flow and temperature of the inlet coolant. Automatic throwover features in the pumping system and other protective devices all contribute to the dependability and continuity of operation of liquid-cooled generators.



stator winding temperature independent of load

REDUCED THERMAL STRESSES HELP EXTEND INSULATION LIFE

In addition to the greater capacity available with liquid cooling, generators may be operated in essentially the same manner established by the successful operation of more conventional machines.

The liquid-cooling system permits generator output to be increased or decreased with minimum variation of stator winding temperature. Since the cooling liquid at the outlet reflects within a few degrees the actual maximum copper temperature of the bars, the inlet coolant temperature may be regulated—automatically—to maintain copper temperature almost constant, regardless of load.

Longer insulation life is the result, since with uniform stator temperature there is much less expansion and contraction of the stator bars. Automatic regulation of stator temperature can be applied most effectively to liquid-cooled machines either during manufacture or later, if desired. This is just one of the many important features of General Electric liquid-cooled generator stators. Other outstanding features are:

Increased Generator Output—*Hollow strand stator bar construction can remove up to 16 times more heat than conventional cooling arrangements, permitting higher generator ratings.*

Maximum Efficiency—*Little power is required to circulate the coolant; also a larger cross-section of copper is provided in the winding.*

Design Simplicity—*Dielectric system maintains the simplicity and dependability of conventionally-cooled machines.*

Dependable Operation—*Many unique features are incorporated into the design of the closed coolant system to provide a permanently tight liquid circuit.*

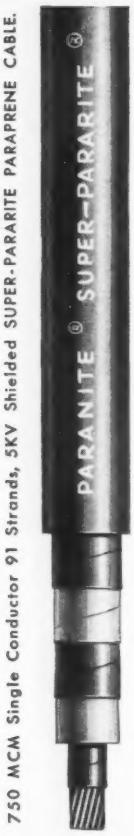
Shorter Maintenance Inspections—*Simple, single-stage, low-pressure hydrogen circulating fans facilitate disassembly and inspection.*

For more information on liquid cooling, contact your nearest Apparatus Sales Office or write for bulletin GER-1231, Large Steam Turbine-Generator Department, General Electric Company, Schenectady 5, N. Y.

254-74

Progress Is Our Most Important Product

GENERAL ELECTRIC



750 MCM Single Conductor 91 Strands, 5KV Shielded SUPER-PARARITE PARAPRENE CABLE.

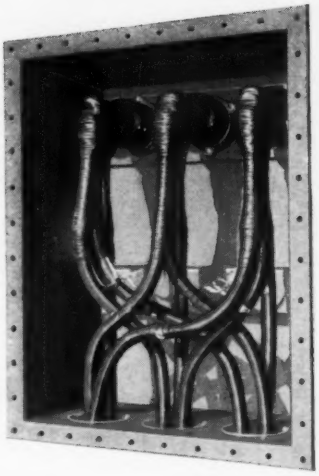
PARANITE®

SUPER-PARARITE® PARAPRENE®

CABLE

Installed at Turkey Creek

Here's another example of power—Paranite—and American industry . . . the selection of Super-Pararite Paraprene Cable for the new Turkey Creek Pumping Station at Kansas City, Missouri. The Super-Pararite butyl conductor insulation is recognized for superior resistance to heat, cold, moisture, oxidation and ozone, while the Paraprene neoprene jacket possesses inherent resistance to sunlight, abrasion, ozone, heat, oil and chemicals . . . one of many Paranite products which has earned the industry reputation—"IF IT'S PARANITE IT'S RIGHT."®



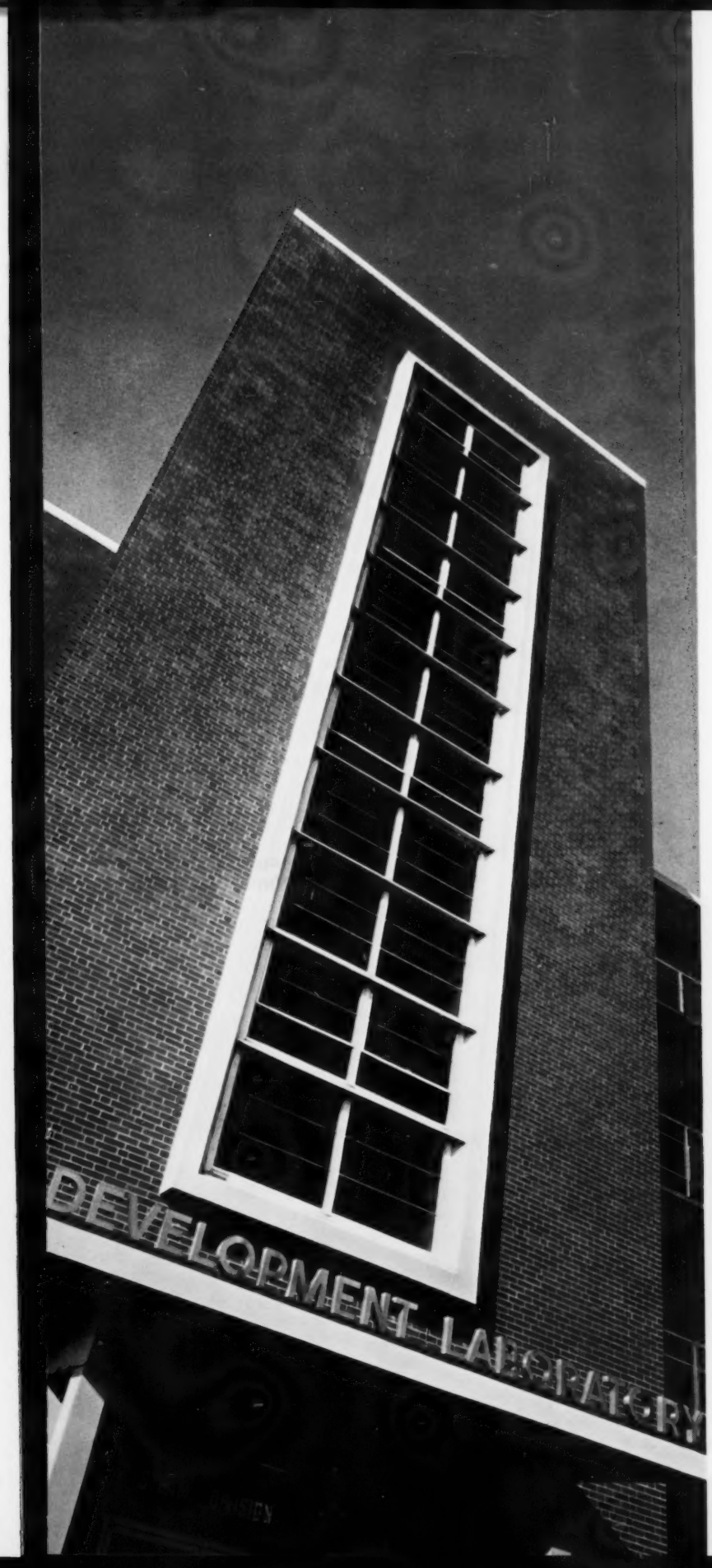
PARANITE WIRE AND CABLE DIVISION

Essex Wire Corporation, Fort Wayne 6, Indiana

MANUFACTURING PLANTS: Birmingham, Ala.; Anaheim, Calif.; Jonesboro, Ind.; Marion, Ind.; Tiffin, Ohio

Sales Offices in all Principal Cities

LIVE BETTER ELECTRICALLY



The credit goes to utility men

Of the many who share credit for today's low-cost electricity, one group deserves special mention. They are the utility men whose suggestions initiate many Westinghouse research and development projects . . . projects that result in new and more efficient designs for machines and equipment used by utilities.

Utility men have strong partners in the more than 6,000 scientists, engineers and technicians who work in the many Westinghouse research and development laboratories. For example, in this $6,000,000 Steam Development Laboratory, more than 100 engineers and technicians are developing new metals and more efficient designs for turbines and allied equipment.

Plowback of earnings into research at Westinghouse produces the *advanced* design machines that help utility men in their battle to generate more and more electricity, always at low cost.

YOU CAN BE SURE...IF IT'S

Westinghouse

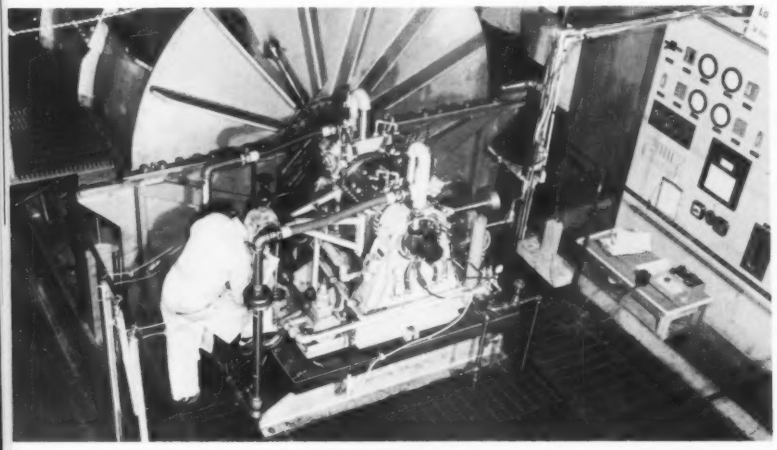
The 1970 turbine is here . . . in the Westinghouse laboratory!

ANOTHER EXAMPLE OF EARNINGS PLOWED BACK

It's here today because every day Westinghouse research and development engineers are getting the answers to the long-range questions, such as . . .

"Will the rotor alloy now used do the job under projected steam conditions?" If not, a research project is on its way to create the alloy that will be needed for the turbine of the future.

It takes longer to do the impossible, but Westinghouse starts doing it *before the need is an emergency*.



EFFICIENCY GAINS FOR L-P TURBINES

In the Steam Development Laboratory, a major development project is aimed at significant gains in the low-pressure end of the turbine. The project revolves around a unique L-P turbine test facility. Using this $1,000,000 development tool, Westinghouse engineers are testing numerous combinations of new designs, recording the performance of every part under varying conditions.

NEW BLADING ALLOY

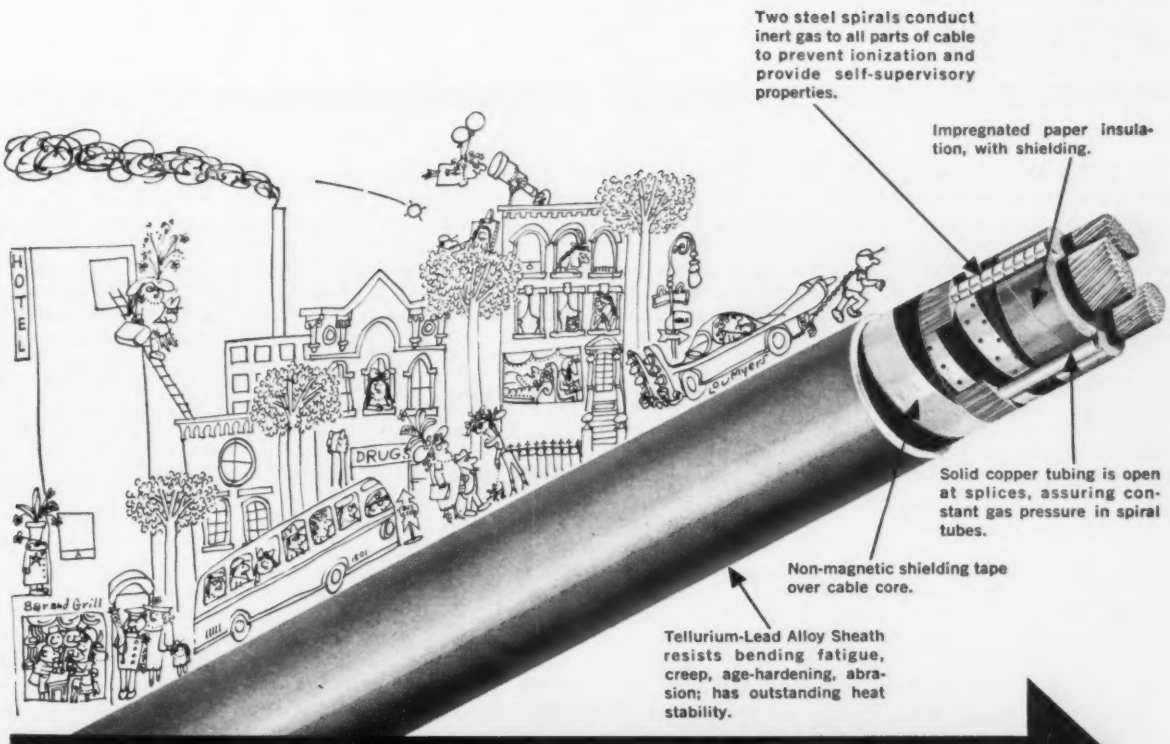
What's to be used when advanced steam conditions exceed the limits of blading metals now available? Development engineers are now evaluating a new Westinghouse alloy that may be the metal of the future. *For example, at 1200°F*, the tensile strength is phenomenal—100,000 psi; the damping characteristics—excellent. After exhaustive tests are completed, Nivco alloy will be introduced as another Westinghouse "first."

WORLD'S MOST EFFICIENT TURBINE

A new peak of efficiency for that 1970 turbine will be assured by hard-won development steps taken within the next 12 years. A giant step is the turbine-generator now under construction for the Philadelphia Electric Company. *It will be the world's most efficient turbine.* This 325,000-kw super-critical unit will use the highest temperature and pressure steam ever projected . . . 5,000 psi at 1200°F.

JI-97233-2

YOU CAN BE **SURE**...IF IT'S Westinghouse


Two steel spirals conduct inert gas to all parts of cable to prevent ionization and provide self-supervisory properties.
Impregnated paper insulation, with shielding.
Solid copper tubing is open at splices, assuring constant gas pressure in spiral tubes.
Non-magnetic shielding tape over cable core.
Tellurium-Lead Alloy Sheath resists bending fatigue, creep, age-hardening, abrasion; has outstanding heat stability.
HOTEL
DRUGS
Bar and Grill

KEEPS UPHILL POWER "ON THE LEVEL"!

ROEBLING
GAS-FILLED CABLE

What happens when solid-type cable is used on steep grades? If you've used it, you know! The oil impregnant simply obeys the law of gravity and drains to the bottom of the grade. At the low point, hoop stress (caused by oil pressure build-up) makes the lead sheath stretch. Eventually a rupture occurs. And in the areas drained of oil, ionization takes place.

What's the answer to this constant (and inevitable) problem? *Roebling Low-Pressure Gas-Filled Cable*—for voltages up to 46 kv! Dry nitrogen gas, inside this cable at approximately 12 psi pressure, provides consistent dielectric properties throughout the length of the cable. No matter how steep the grade, internal pressure is uniform everywhere.

Another feature of this cable is that it is self-supervisory—an alarm system lets you know if there's trouble along the line.

Roebling Low-Pressure Gas-Filled Cable is as easy to splice as solid-type paper power cable. It offers the least expensive long-term answer to the problem of transmitting power uphill! Get the whole story from your Roebling Field Representative soon. Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

ELECTRA'S HUSBAND

ELMER, the engineer, had just settled himself on the far side of the table in the coffee room so he could get a better check on the three secretaries as they sat at the next table, sipping their coffee between bits of conversation regarding last night's activities. He wasn't interested in their conversation. In fact, his mind was far away as he awaited the approach of Al, the accountant, who walked slowly toward Elmer's table, carefully balancing a too-full cup of coffee and muttering something about losses. He had just paid for both his and Elmer's coffee by losing the "flip."

"Losses, losses, losses! Last night it was power, now it's coffee. If I just had someone to pay my losses, I wouldn't need any salary."

"Well, losses pay my salary," said Elmer, testing the temperature of his brew.

Al, being used to unusual or even eccentric statements from engineers, couldn't ignore the remark. "How come?" he remarked.

"Well, it's this way. We work for a company whose business it is to generate and sell electric power. Unlike many businesses, our product cannot be stored so our capital investment goes mainly for two things: (1) generating equipment and (2) what you can call delivery equipment, which includes transmission lines, substation and distribution facilities. Now, naturally, the generation has to be adequate to meet the total needs of all the customers at any one time plus a little room to grow in. Of course the goal is to generate the most kilowatt-hours at the right time for the least cost per kwh. You know the story."

"Yes, I ought to," thought Al to himself, "I ask this guy a simple question and get a review of the power business."

"Now, it's a little different with the delivery equipment; it not only has to be adequate to deliver all the power the customers want when they need it," continued Elmer, "it also has to do the job as efficiently as possible consistent with a reasonable capital investment.

"Suppose for the moment that some research lab had developed the ideal conductor—one with no electrical resistance. This conductor would have no losses. Think what you could do with it! In the first place, electric power lines could be as long as we wished, the conductor size wouldn't be important since even a small conductor would not heat while carrying current, and we wouldn't even need high-voltage

Lesson on Losses

transmission lines since we could deliver any amount of power over a low-voltage line."

"Too bad we don't have some so our capital investment could be cut way down," said Al, practically.

"Let's return to reality. Our conductors *do* have losses and we *do* hire engineers to figure the most economical combination of moderate losses and moderate cost of capital investment."

"Very true, Elmer, I see your point. But I have heard it said that losses are not important in a hydro system since the water runs down the river anyway. Now, with steam power they can save coal by reducing losses but we can't store water—not for very long anyway."

"I'm glad you brought up that point. It is different with our hydro compared to steam generation. So let's assume that we have a new power plant plenty big enough to supply present power requirements, plus lots of room to grow."

"Our loss troubles would sure be over then, wouldn't they?" said Al as he regretfully watched the secretaries getting ready to leave. "If we had high transmission and distribution losses, we could supply them at practically no cost—at least until our load increased and we needed that power to sell to our customers."

"You know, Al, there are a lot of people sharing that view. We might say it is popular opinion. Let's look at it a little more carefully. First, let us concede for the sake of argument that power—both kilowatts and kilowatt-hours—are absolutely *free* at the power plant. "Now let's look at a certain distribution line that figures out to have 100-kw loss at peak load."

"What do you mean, 100-kw loss at peak load? Why peak load?"

"Well, peak load, of course, determines the size the entire system must be. It can be bigger but not smaller than the size adequate to deliver the peak load. The 100-kw loss at peak means that without such a loss we could deliver 100 kw more to our customers or that the delivery equipment between the distribution line and the power plant could be smaller by 100 kw to deliver the same power to the customers."

"What you are trying to tell me then is that 100-kw loss on a feeder automatically requires that the substation, the subtransmission line and the long lines all *have* to be 100 kw bigger in size, the same as the power plant, just to carry the 100 "dead" kw lost in distribution?"

"You're a good accountant, Al, you summed up what I've been telling you better than I could. On the average, how much per kva do substations, subtransmissions and transmission lines cost?"

"That's a good question. I have heard the figure of $170 per kva used—now that doesn't include generation, which is about that much more. Say, how come you engineers say kw, sometimes kva?"

"Now, if I told you that you could be an engineer and I might be out of a job. You say $170. What's our capitalization rate?"

"About 17%, I think."

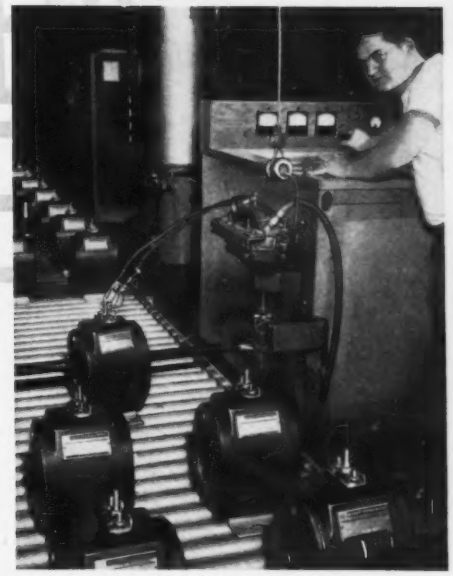
"Okay, let's see: .17 times $170 times 100 kw. That's 2,890—say $2,900 per year we pay for the privilege of losing 100 kw on one feeder, not considering generation costs."

"That is a lot of money when you count up how many feeders we have. Are they all that bad?"

"Oh no, but one of our most pressing problems is to calculate such information for all feeders."

Al pondered the problem for a moment. Finally he spoke: "You have certainly given me a new slant on distribution losses. It's like a store having something all wrapped up ready to sell over the counter, then throwing away part of it."

"Yes, that's a good way to look at it. All losses cost us something, but the nearer to the customer a loss occurs, the more it costs. It's the engineer's job to design the electrical system so that losses are as low as possible consistent with the yearly cost of the capital investment. So you see how losses pay my salary."



Now Available . . .

18 types of cast epoxy resin instrument transformers

To meet industry's growing demand for these superior quality instrument transformers, Allis-Chalmers has instituted a program of developing a number of new types for various applications — and has more than doubled previous production capacity.

No Maintenance — Easily Installed

Epoxy resin, virtually a miracle material, gives transformers complete protection—both electrical and mechanical—either outdoors or indoors.

Allis-Chalmers epoxy resin transformers:

1. Have excellent dielectric properties.
2. Can withstand wide temperature variations and severe mechanical shocks.
3. Are maintenance free . . . require no painting, resist solvents.
4. Can be installed in any position — quickly, easily.

Your A-C man will give you the complete story, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

Types of epoxy resin cast transformers available

Type	INDOOR	OUTDOOR	INSULATION CLASS	CURRENT RATINGS (AMPERES) 10-5	15-5	25-5	40-5	50-5	75-5	100-5	150-5	200-5	300-5	400-5	600-5	800-5	1000-5	1200-5	1500-5	2000-5	3000-5	4000-5
BKM	X	X	600														X	X	X	X	X	X
LM	X		600														X					
MM	X	X	600									X		X								
TWM	X	X	600									X		X	X	X						
BKIM	X		5000															X	X	X	X	X
BKAWIM	X	X	5000															X	X	X	X	X
BKWDIM	X	X	5000															X	X	X	X	X
BKM PLUS KIT	X	*X	5000															X	X	X	X	X
LRM 45-KV IMPULSE	X		5000	X	X	X	X	X	X	X	X	X	X	X	X	X						
LDM 45-KV IMPULSE	X		5000	X	X	X	X	X	X	X	X	X	X	X	X	X						
TWM PLUS KIT	X	X	5000									X		X	X	X						
BK2M	X		8700															X	X	X	X	X
BKAW2M	X	X	8700															X	X	X	X	X
BKWD2M	X	X	8700															X	X	X	X	X
BK3M	X		15000															X	X	X	X	X
BKAW3M	X	X	15000															X	X	X	X	X
BKWD3M	X	X	15000															X	X	X	X	X
K3M	X		15000	X	X	X	X	X	X	X	X	X	X	X	X	X						

A-5814

ALLIS-CHALMERS

editorial views

Dollars Cast

SOME figures that pinpoint the value of research studies and engineering improvements were recently included in the Westinghouse Engineer. Distribution transformers were the case in point. In the past 25 years the cost of copper, electrical steel and labor has risen an average of 373%. In the same period the price of distribution transformers has risen only 64%. This represents the contributions that modern production procedures have made possible—but it's only a part of the story.

In the conventional 25-kva, single-phase, pole-type transformer core losses have been reduced 10% and over-all losses 7% in the quarter century under consideration. At an average annual load of 25 kva, this improvement in losses represents more than $7 per transformer in annual operating costs.

But there's still more. Improved voltage regulation through lower impedance has given the customer better service and pushed more kilowatt-hours through the meter. At the same time it has enabled transformers to carry relatively higher peak loads without change-outs. All in all, the over-all savings capitalized annually at a 15% rate are more than the increase in cost of the transformer over the same period. From the customer's standpoint research dollars spent by the manufacturers are a real bonus—particularly if the case of distribution transformer improvement is typical.

State of the Unions

REPRESENTATIVE Ralph W. Gwinn of New York read into the Congressional Record some remarks that should be "must" reading for every businessman. In some very forthright statements, he spelled out the reasons why the United States now has a labor government. He described the highly organized way in which unions set about to elect their chosen people to Congress and he spelled them out with details and dollar signs. He included in his remarks Donald R. Richberg's statement, "Labor's economic monopoly and political power are preparing the way for communism far more effectively than the communists themselves."

The essence of Congressman Gwinn's remarks is that business cannot hope to get any of its ideas or recommendations across in a Congress which, to a large extent, owes its election to solidly organized union vote-getting. He explodes the myth that lobbying activities can produce results that businessmen want. He deplores the fact that businessmen run to Washington to try to put out legislature fires when they should be paying attention to those being elected from their own precincts.

He states categorically that trade associations, chambers of commerce, conservative organizations of all types, service clubs and management organizations are not doing a job and: "The average businessman is 'milk fed' by the representatives of business in Washington. . ."

He goes on to say that unless business organizes and becomes politically active it can expect little help from Congress.

The only possible solution he recommends is to demand that local business associations become active in political affairs immediately, political activity that includes ringing doorbells, establishing telephone brigades and pushing voter drives aggressively. He concludes with the statement: "Business organizations and associations must provide the leadership, the money and the manpower for business political action and they must do it now."

Seldom has a member of Congress been so outspoken about the dangers and implications of the present political situation. Seldom has a congressman put on paper such a clear insight as to what happens inside our legislative halls. We congratulate Congressman Gwinn for his bold and forthright stand and we hope that his remarks will not lie unheeded in

the musty files of the Congressional Record.

Double Standards

THE design and installation of residential wiring systems are covered by two different publications with quite different objectives. This should not be confusing to members of the industry or to the ultimate customer. The National Electrical Code (American Standard C1-1956) is a basic wiring standard intended to insure the ultimate customer from the hazards of fire and shock. It is a minimum wiring standard promoting safety in electrical installations.

The Residential Wiring Handbook, on the other hand, is a specification type of document whose purpose is to provide information for the installation of wiring suitable for the total electrical needs of the modern home. In contrast to NEC, it is a standard of adequacy. Such a standard of adequacy is needed because the responsibility for meeting National Electrical Code requirements is vested in the electrical inspector or in an inspection department where the responsibility is primarily safety. The responsibility for wiring for full electrical usage should not be charged to an official whose authority by law is limited to matters of safety.

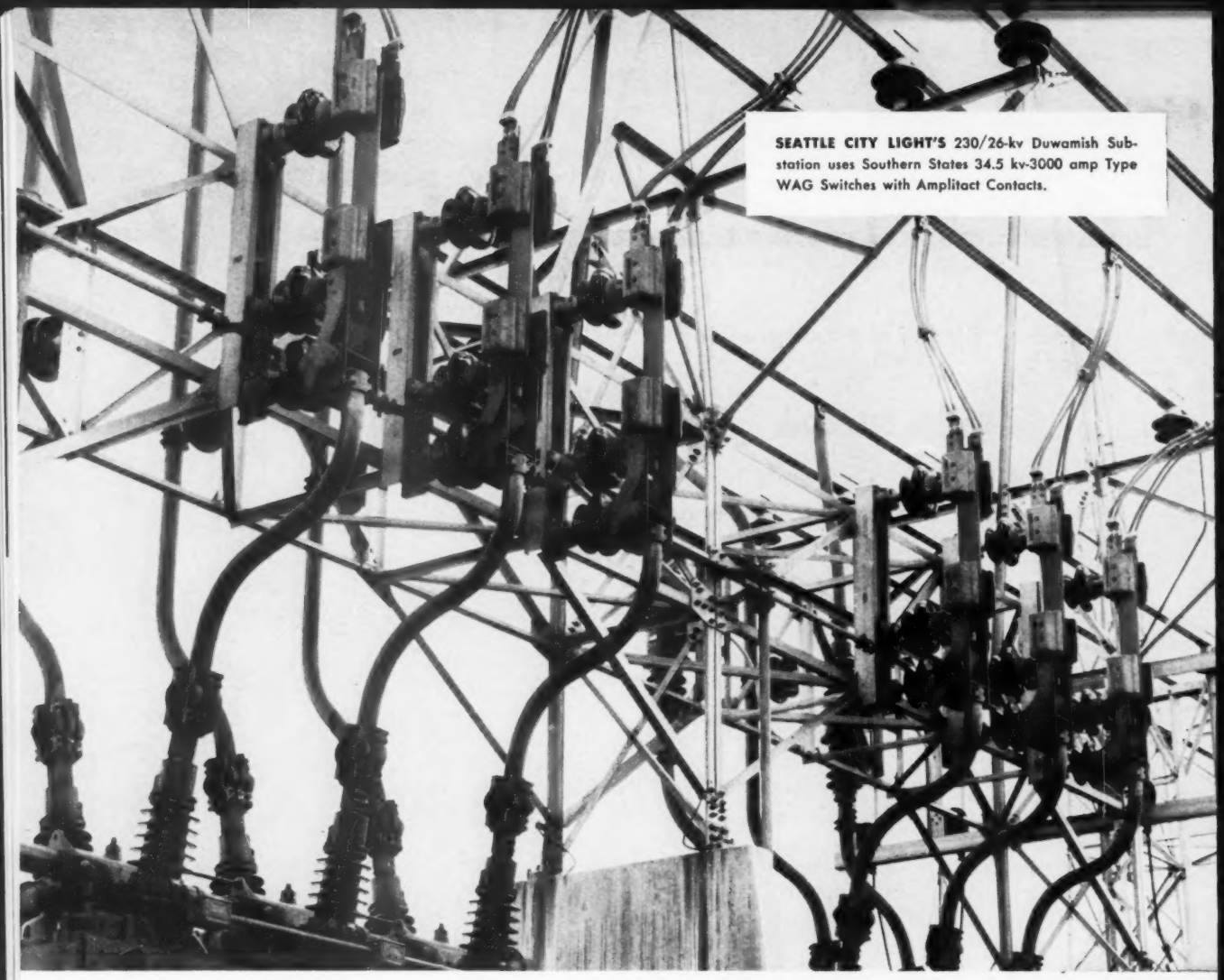
The Residential Wiring Handbook was approved by American Standard Assn. on June 20, 1958, as an American Standard. The current Residential Wiring Handbook is the third edition and nearly 500,000 copies have been printed and distributed for use by the many agencies affiliated with the National Wiring Bureau. A fourth revision is now in process, a revision made imperative by the rapid increase in the use of air conditioning in residences and the ever-increasing use of electric heat in the home. While the National Electrical Code is widely adopted by municipalities as the standard of electrical safety in wiring installations, it would be still better if the Residential Wiring Handbook, now also an American Standard, could be widely adopted as the yardstick of both electrical adequacy and safety for the towns and cities of America.

Peak Suppressor Needed

LONG-RANGE advance planning has long been a standard tool of the utility industry. But to anyone who would plot the "orders placed" curve for heavy equipment such as steam turbines and power transformers it would appear that the utility industry lives a hand-to-mouth existence. This curve is characterized by extremely high peaks and deep valleys — 1958 being one of the valley years.

All predictions indicate a heavy sustained growth in power demand. Individual utilities concede that substantial commitments have to be made to meet these demands. In fact, if the last few weeks' energy output figures are right, there will soon be a concerted rush to place orders for steam turbines. Then another "peak" year confronts the manufacturers.

For the manufacturers, trying to maintain a high quality engineering staff and the highly skilled factory labor needed to produce such equipment is indeed frustrating under present conditions. It's not only frustrating but it's costly, too, because factories are either working overtime to meet the peaks or trying to reassemble staffs that were scattered during valleys. In view of the assured fact that growth is here to stay for a considerable period, isn't it possible to work out some scheme that will help improve the load factor on the production facilities for the heavy equipment that is going to be needed? It might take a lot of coordination and correlation but the potential benefits from a solution loom large. We venture to suggest that a joint EEI-NEMA exploration of the subject might be in order.



SEATTLE CITY LIGHT'S 230/26-kv Duwamish Substation uses Southern States 34.5 kv-3000 amp Type WAG Switches with Amplitact Contacts.

The Man-sized Switch for Man-sized Jobs

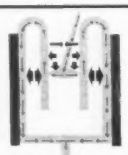


FIG. 1

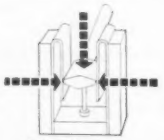


FIG. 2

AMPLITACT® CONTACTS ON WAG

High pressure Amplitact contacts provide maximum dependability under high current short-circuit conditions. The arrows in Fig. 1 show direction and relative magnitude of electromagnetic forces induced when switch is subjected to fault current.

The resultant electromagnetic forces, as shown in Fig. 2, greatly increase contact pressure and positively hold blade in the engaged position. For complete details, write for Bulletin 56AM on the Amplitact.

"Don't send a boy to do a man's job" is a saying especially applicable when choosing switchgear that must safely carry 3000-4000 amperes. Not only must it be capable of carrying such loads after years of service, but it may be called on to withstand fault currents up to 120,000 amperes without damage.

It's a man-sized job. Dirt, industrial waste, years of exposure to every type of contamination make the job even tougher. It takes a man-sized switch!

The Type WAG illustrated above is a good example. It's big and tough enough to carry its rated load continuously without excessive temperature rise. A built in safety factor more than compensates for the deteriorating effects of long, hard service. Amplitact® contacts provide high pressure for handling the heaviest faults.

The WAG is finding wider and wider acceptance in all ratings. It's now in service in virtually every state in the union.

Get complete details from your Southern States representatives or write direct for our latest bulletin.

LIVE BETTER ELECTRICALLY

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

ELECTRICAL WEST SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. VOL. 121, NO. 5 NOVEMBER 1958

Trade with our allies required it, so now . . .

UL Labels Foreign Products

Karl Geiges
Vice-President, Underwriters' Laboratories Inc.
Santa Clara Calif.

FASTER travel and better communications continue to shrink our modern world and bring foreign manufacturing plants ever closer to the U. S. market place. As a result the import of their output is steadily increasing and these goods are finding their way onto our sales shelves and into our homes and business places. There are lighting fixtures from Finland, sewing machines from Italy and Japan, cleaning machines from Sweden, wire and X-ray machines from Holland, radio and motor controls from Germany, to name a few. One question the reader will naturally ask when faced with this international array of electrical equipment – are they proper and safe for use in this country?

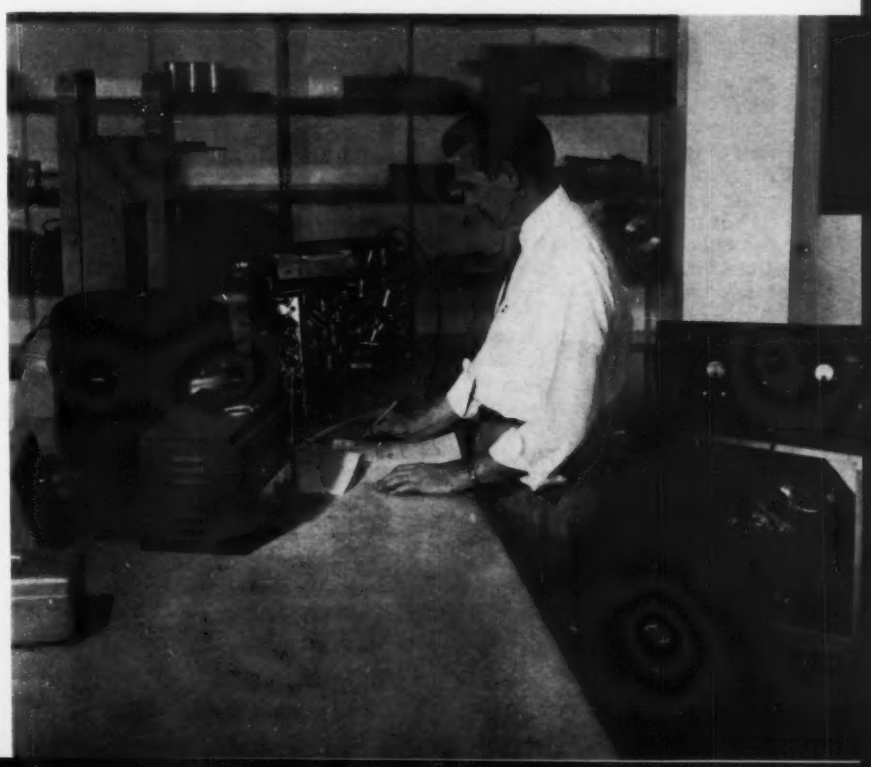
The variations in voltage and frequency make it necessary for the appliance manufacturers in foreign countries to design their equipment specifically for the United States market. Some industrial equipment, however, can be applied equally well in most countries of the world. Safety, on the other hand, must go further than the appropriate voltage and frequency ratings. Safety is concerned with our methods of utilizing electrical appliances and equipment and, perhaps even more important, our habits in this regard.

The safety that is built into equipment by U. S. manufacturers must also be incorporated into the product of foreign manufacturers. Departures from the recognized safety level for imported goods would inevitably result in injury and property loss in this country. Underwriters' Laboratories is prepared to serve as a clearing house to assure that these products meet the recognized safety requirements. The services of the Laboratories to accomplish this objective are not intended nor should they be considered as a trade barrier.

The importing of electrical equipment is not new. For example, switches made in Switzerland were sold in this country back in the 1920s and were examined at the port of entry for compliance with American safety standards. Similar cases could be cited of equipment that could be adequately examined at the port of entry.

Not all products, however, can be adequately inspected in the finished form but must be examined and tested while in production. Such a problem was presented with fire hose and was solved by setting up inspection facilities in England in 1914.

In the electrical field there was no serious demand for inspection facilities at the point of manufacture until the period following World War II. The mutual aid program which formed a part of the postwar recovery effort made it attractive



Testing a TV set at the Santa Clara Laboratory for its electrical safety

Main electrical laboratory at Santa Clara in which electrical materials and devices made in the West are given UL examination

for foreign countries to obtain American dollars by the sale of their manufactured goods in this country.

It was not long before certain electrical equipment, which could not be examined on a port-of-entry basis, encountered the problem of establishing its conformity with United States safety standards. For example, any foreign manufacturer who desired to have his cord-connected appliances inspected on a port-of-entry basis had to have the cords supplied in this country because no overseas manufacturer was set up to make flexible cords under the Laboratories' Factory Inspection and Label Service program. Flexible cords obviously must be inspected where they are made. Wire manufacturers in Italy and England discussed the possibility of obtaining factory inspection service in order to eliminate the shipment of United States-produced wire to Europe for return with the product or having to arrange for the attachment of the supply cord in this country.

After many discussions with European electrical manufacturers and their representatives, a program was developed under which the inspection work could be conducted at the manufacturing source. No restrictions were put on the location of the factory but it was expected that most of the activity would center in European countries. Two points were considered essential to the program: (1) that there should be no differentiation between the requirements for foreign and U. S. made goods and (2) that the entire expense should be borne by the manufacturers involved and not by United States industry.

The question naturally arose of utilizing the facility of foreign laboratories rather than shipping the new work sample to this country for the original investigation. A basic policy on this point was established many years ago before consideration of operating overseas. It is this: the Laboratories' opinions on which its listings are based are arrived at after its own investigation conducted in its own facilities by its own personnel. The Laboratories cannot base its engineering judgments on the basic work conducted by others. In foreign operations, the problem would be compounded by reason of distance and language. The program was thus initiated with the original new work examination and test being conducted in this country but because of necessity with the follow-up work being handled on a local basis in the manufacturer's plant.

To get the program started, a qualified engineer visited plants in England, Italy, Holland and Norway in 1956 to establish inspection centers. The following year Austria was added to the list and more recently France and Germany have been included. To date, no facilities have been set up across the Pacific but experience gained in Europe will make this development practical whenever it is found necessary to establish service in the Orient.

Reports indicate that radio receivers, air conditioning equipment, refrigerators and even ranges are being considered for import utilizing the Laboratories' services. It may be feasible to inspect some of these appliances at the port of entry but where the inspection cannot be conducted effectively the inspection will be performed at the point of manufacture.

What does this development mean to inspection authorities, contractors and manufacturers in this country? It makes possible the assurance that foreign manufactured goods, for which there is demand in this country, will fit into the well established municipal, state and national ordinances and laws covering electrical equipment. Also, that the installations can be made under the National Electrical Code requirements in a standard workmanlike and safe manner.

Human Relations in Business

Is It a Boondoggle?

Joseph G. Phelan, Ph.D., Personnel Development Counselor, Bechtel Corp.

Problems of Management—XI

For some years, progressive and enlightened managements have stressed human relations principles in their executive development programs.

The manager is seen as a man who strives, among other things, to:

1. Lead by inspiration and persuasion rather than command;

2. Make a balanced and effective use of all the human and material resources at his command; and

3. Is able to inspire his subordinates to act with initiative, self-development, self-discipline and competence as members of a team, and to maintain two-way communications at all levels.

Very recently, the human relations platforms, policies and practices of industry have come under sharp attack. Human relations vs individualism has become a controversy of some magnitude. Here, side by side, are the pros and cons.

The promoters of human relations stress frequent in-company conferences as an important means of accomplishing management objectives. To solve problems of organization, finance and leadership, managers, they say, should determine the consensus, always striving for group agreement.

The individualists attack these group methods. For them, group education's emphasis on the team destroys initiative and stifles creativity. Group thinking forces everyone to agree, individual thinkers become afraid to express ideas that conflict with the group and the whole company goes over the cliff together. As Whyte puts it in "The Organization Man": "—Organizations (today) deify cooperation; in actuality, there remain places where success still comes to those motivated by the old individualistic competitive drives."

Human relations experts stress democratic management. All individuals in a design engineering department, for example, would participate in developing policies and in making decisions. The thing to emphasize is the feeling of belonging — of mutual confidence and understanding. The democrats encourage managers to work with their peers and subordinates in committees and project groups to gain a better insight into one another's problems. Through the practice of human relations, i.e., the use of moderation and compromise, they hope to promote company-wide efficient operation.

Attackers of human relations prefer to emphasize the controversial aspects of "which way to turn" problems. They like to see department heads fight out their differences.

The fact that long-standing feuds often spring up as a result of this practice does not seem important. Sometimes in a warring company, departments stop trying to exchange essential information because department heads are locking horns in a destructive internal fight.

Human relations champions push programs of executive development. They teach managers to be self-conscious, at least at first, in their daily practice of human relations principles. Companies profit, they feel, from the analysis of problems of organization and human relationships. Managers get production when they learn more effective skills in directing and leading people.

An opponent of this trend, McNair, writing in "Harvard Business Review," states: "When any man consciously undertakes to practice human relations, one of several bad consequences is almost inevitable. Workers get the feeling that the managers manipulate people for their own ends. Managers develop a yen for managing people's lives. Human relations are blown up to a pseudo-science."

Check Your Score On Test, Page 14

Nos. 6, 7, 9, 10 are true, the others are false.

Human relations specialists claim they develop an approach by which men in industry work together harmoniously to promote the goals of the organization. They are accused of intimidating members into going along with the group. They are supposed to stifle individual ideas by this means and of forcing conformity.

Their accusers seem to want to return to the rugged individualism of the past. A look at industry in the 19th century will tell you why it died.

The case for human relations is well put by Robert Johnson, president of Johnson & Johnson: "For many years we have chosen managers from men who have been educated as technicians and as specialists. Our men have not been educated in the science of human engineering. In the future, to get maximum cooperation, managers must be grounded in the field of human relations."

As we examine the arguments, it seems that both sides have overstated their position; there is a degree of merit in the things both are saying. The best program for industry today lies somewhere between the extremes.

Here are some middle-road principles.

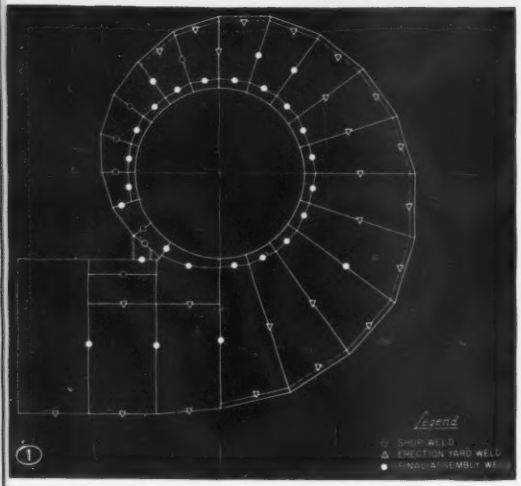
1. It is still necessary for business managers to understand human behavior and human motivation in order to provide the leadership necessary to achieve the goals of the enterprise.

2. Managers who consciously practice human relations must find a sure way to preserve an atmosphere in which workers can feel free to have opinions, to disagree with the group, to point out new, even startling, directions.

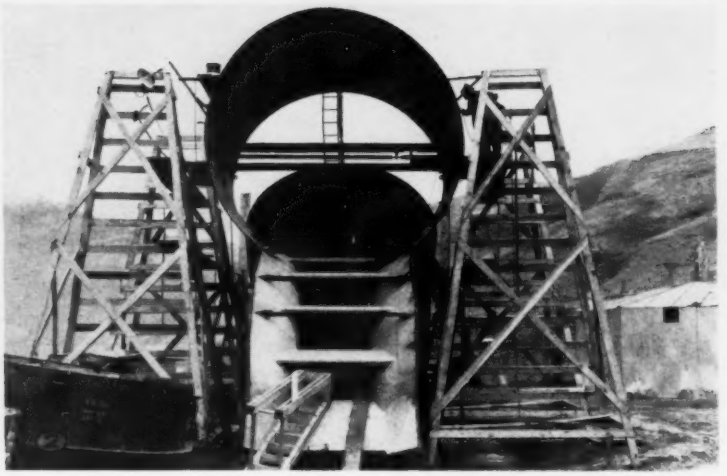
3. There does not need to be a deep, essential conflict between the need for managers to be firm, to maintain high work standards and the acceptance of human relations principles.

4. We must not lose sight of the need to encourage creative thinking, and build differences of opinion and independence of thought.

Do these principles seem to meet the realities of your business? (Or is this question a boondoggle?)



1. Factory fabrication done in sections as large as could be conveniently shipped. The diagram above shows where the various welds were made—in the shop or erection yard, or final assembly in the turbine pit.



2. It was decided to preassemble the scroll case into as large pieces as could be handled in the erection yard. The stay ring was leveled on its parting face and approximately half the case was erected in a vertical position in the erection yard.

Reduction in turbine costs as . . .

T-1 Steel Proved at Brownlee

Fred R. McCormick, Chief Engineer, Power Plant Construction, Idaho Power Co.

As the trend toward constantly increasing prices for material and labor goes on, the necessity arises to find new and more economical methods of doing work so that the industry will not be priced out of the market. One such development, which has occurred in recent years, is the trend toward welded spiral cases for waterwheels. This results in more efficient turbines and lower installation costs. The riveted steel case of a few years back is the exception, rather than the rule. These cases have been made generally of a low carbon steel plate, where forming is easy and welding presents no problem.

As power systems have grown, the size of hydraulic turbines has increased. As the machines grow larger, the waterways grow larger and the plate thickness necessary for the casings become greater and greater. In the case of the Brownlee development, a low carbon steel casing would have required plate in excess of 2 in. thick. Therefore, during the negotiations for the Brownlee turbines, manufacturers proposed the use of a high-strength alloy steel, known as T-1.

Characteristics of T-1

T-1 steel is hardened by water quenching from 1,650 F and tempered at 1,100 F to 1,250 F. It has a yield strength of 90,000 psi and an ultimate strength of 105,000 psi to 135,000 psi. This compares to a yield strength of 30,000-40,000 psi and an ultimate strength of 50,000 - 65,000 psi for mild steel. It has a high-notch toughness and satisfactory ductility. Several large pressure vessels had already been constructed of T-1 material by welding and satisfactory results were attained. It cannot be handled with magnets as it retains magnetism, causing arc-blow, resulting in faulty welds.

Investigation revealed that the material was excellent for the proposed purpose, although welding required unusual care and strict adherence to the proper procedure.

The differential in price between a T-1 case and a mild steel case offered by the manufacturer made the offer attractive and an order was issued to the S. Morgan Smith Co. for four 144,000-hp, 235-ft head, 128.6-rpm turbines with welded T-1 scroll cases. The reduced plate thickness also suggested savings in welding and fabrication.

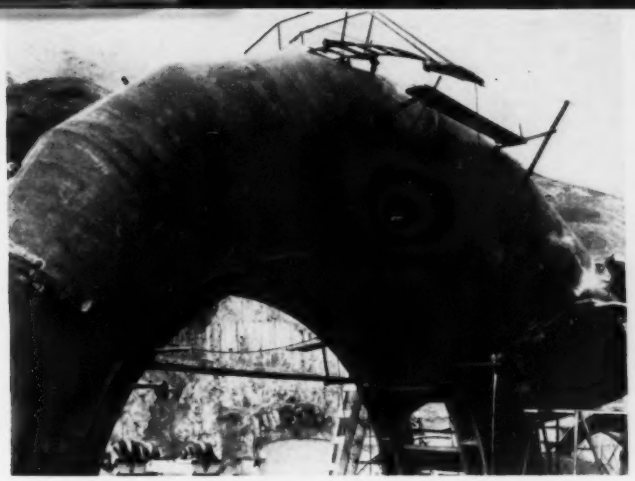
These cases have an 18-ft inlet diameter and a design pressure of 148 psi, including water hammer. The stay ring was made of ASTM 148 grade 80-50 cast steel and to this steel the T-1 must be welded. Design stress of 26,250 psi was used but, since the shape of the spiral case is not symmetrical, it was decided to use 80% for the weld joint efficiency.

Transition Section Needed

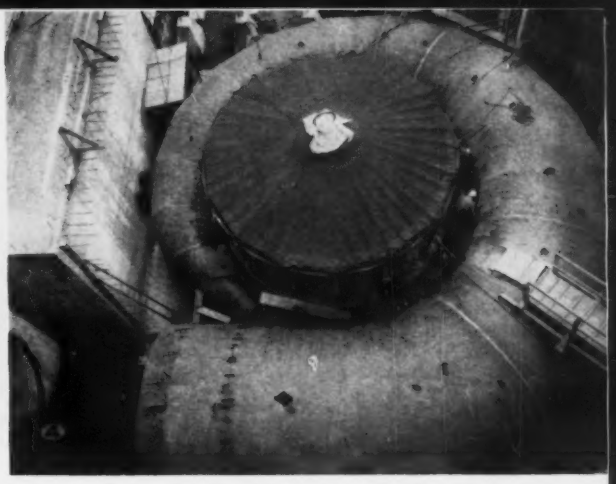
The difference between the yield strengths of the cast steel and the T-1 required a transition section between the stay ring and the case. This was done by welding a tapered skirt plate of T-1 to the stay ring. After being ground and inspected, the stay-ring-skirt plate assembly was stress relieved before final machining. This eliminated residual welding stresses from the most critical welded joints and made field heat treating unnecessary.

It has been customary on riveted cases to assemble the spiral case completely to the stay ring in the manufacturer's shop. However, since these are welded cases, it was decided that some sections would be completely assembled and welded, except at the stay ring spiral case joint, leaving sections that could be trimmed in the field to fit. As the case was assembled in the manufacturer's shop and welding began, it was found that shrinkage on each joint amounts approximately to 3/32 in.

Shop welding was done using alloy rod AWS type E10016. This is a rod having a yield point of 110,000 psi and ultimate tensile strength of 121,000 psi. It is an iron powder, low hydrogen electrode designed for



3. The case was attached to the stay ring transition skirt (arrow) with key plates, but not welded. Horizontal and girth joints were welded after shop measurements were duplicated. The sections of the scroll case were removed from the stay ring which was then assembled in the power house.



4. Sections of the scroll case were rolled into position and again attached to the stay ring with key plates. The remaining girth joints were welded while the case was floating on the key plates. Finally, the case was welded to the transition section. Notice gas preheater around scroll.

all position welding of low alloy, high tensile steel where welds of 120,000 psi tensile strength are required and where the fabricated part is to be used in the as-welded condition. Stress relieving is not required. For the field welds, alloy rods type E11016 were selected.

Special Factory Techniques

The plates were cut in the factory using an unusual device. The drawing of the plate is made and photographed exactly to scale. The film is mounted in a projector located in a small trolley high above the cutting room floor, upon which the plate is positioned. Light is projected through the film, and the lines show as shadows on the plate. It is necessary to bend the plate slightly to remove the error due to photographic and lens distortion. When certain measurements are correct on the plate, the cutting is done along the shadow lines. The plate is then formed in the usual manner by rolling or pressing, as required. The T-1 steel had more of a tendency to spring back than does mild steel plate and, therefore, required much more deformation to accomplish the bending required.

In the early stages of manufacture, the contractor's erection superintendent, B. Mark Johnson, visited the factory and agreed with the manufacturer's representative that shop measurements would be furnished and all plates would be match-marked after assembly using points 6 in. apart. This allowed duplication of the factory measurements in the field.

The backstep cascade welding procedure was used, which requires very careful control. Preheating is applied to the joint on the side away from the weld and temperatures are not allowed to exceed 300 F at the weld or be less than 113 F at the point approximately six inches away from the weld. Welding is begun in the center of the sheet, progressing toward the T joint between the casing sheets and the stay-ring transition. After about six inches of bead is deposited, the slag is removed and the arc is backstepped to the beginning of the weld. Approximately 12 in. of weld is made on this pass. Slag is removed and the weld is backstepped to the beginning. This procedure is continued until the entire seam is welded to within two inches of the T joint.

Joints are designed for a maximum of downhand welding. The overhead weld is made first, then back-gouged with arcair before proceeding with the downhand weld, which constitutes the main body of the weld.

The final phase of the welding consists of closing the T joint. Again, the overhead pass is made first and back-gouged. The downhand pass is begun at the outer edge of a T section and goes around the 90° joint of the T. The second pass starts at the other end of the T and again goes around the 90° joint. This procedure is continued until the joint is completely filled.

In the early stages of welding the T joints, it was found that transverse cracks appeared across the weld. This condition existed because of the restrained condition of the joint. Opinion is divided among the experts as to the reason for the cracking. Some maintain that it is due to moisture in the rod coating and some maintain it is due to temperature differentials in the plate because of unequal preheating. The manufacturer specified heating at 350 F and allowed the rod to be out

Behind this Story

On Aug. 27, the generators that began turning out electricity from Brownlee power house were sounding their high pitched, triumphant song of praise for many men of foresight and perseverance. On March 24, too soon to hear this tribute, one of the men who contributed to its symphony, Fred McCormick, passed away.

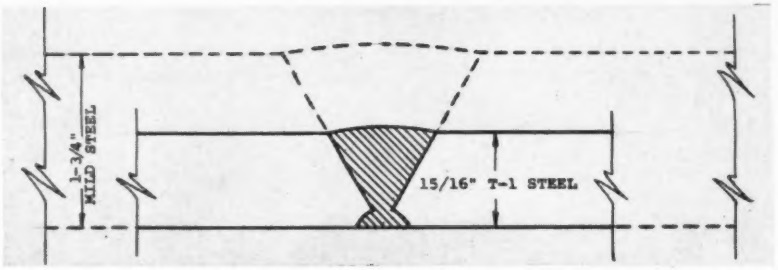
This man's work on Brownlee facilities will be saving millions of dollars for the electrical industry.

World War II brought with it a need for a high-strength steel that did not require precious metals as alloys. The steel industry developed T-1, a treated steel with twice the strength of mild steel that could be used as tank armor. Pioneering the use of this new steel was not easy. A television tower collapsed, killing several people; a pressure vessel exploded during tests—but T-1 would save money for the persons who learned to use it.

S. Morgan Smith Co. proposed to use T-1 in the construction of the Brownlee turbines and Idaho Power Co. had the courage to agree. The critical job of assembly, supervised by Fred McCormick, was accomplished. T-1 was tamed!

One of Fred's last efforts was to document for ELECTRICAL WEST—and for the industry—the story of the fabrication of the Brownlee scroll cases. It is with a deep sense of gratitude to Fred McCormick that we present his story.—The Editor.

of the oven as much as eight hours. After cracking appeared, the field decided to change the specifications and keep the rods in an oven at 800 F for two hours, then at 350 F until they are used. The rods are not allowed out of the oven for more than two hours. Particular care is taken to keep the preheating uniform and asbestos blankets are used to reduce the rate of heat loss after welding. The welds are shielded from drafts to prevent unequal cooling during the process of welding.



Use of T-1 steel cuts plate thickness nearly in half. Reduction of the amount of weld build-up is reduced to a third or less, with savings both in material and labor

Quality Control

Since the use of T-1 steel in scroll cases was new and some difficulties had been experienced in the welding of T-1, particular attention was paid to the quality of the welds. Welders were classified under the code in the usual manner by having the welder make a sample weld, which was machined and then X-rayed.

During the welding of the case, when the first pass was made, it was back-gouged by arcair, then a die-check was made or the weld was magnafluxed to determine whether any cracks existed. This was a particularly important weld since it must be strong enough to withstand the stresses introduced by shrinkage of the weld. Magnafluxing or die-checking was performed whenever it was felt necessary on all other welds. After all welds were completed, all welds were X-rayed before embedment in concrete.

They used standard hardware to build a ...

Power Line Without Poles

Using standard hardware, the secondary power hops from tree to tree enroute to user

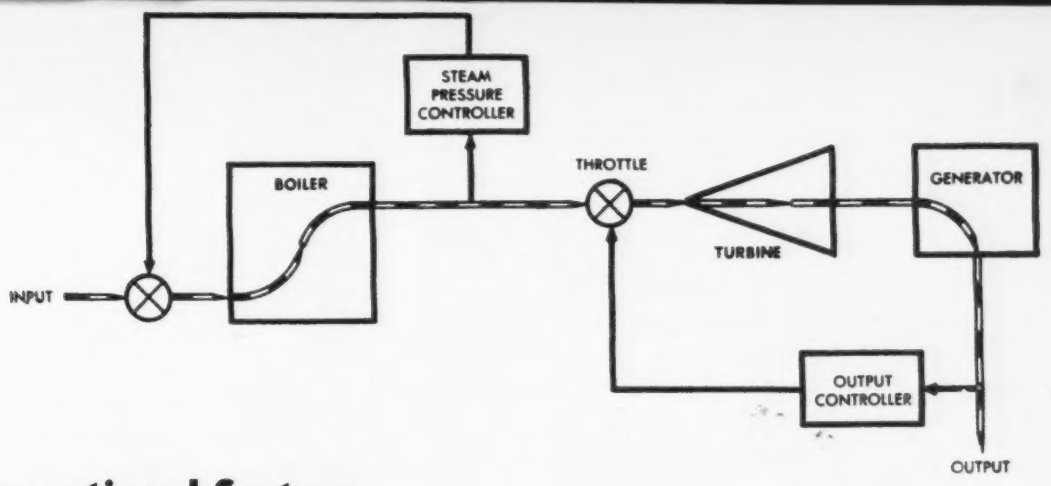
The Forest Service made the suggestion—would the power utility try to modify its construction to preserve the natural beauties in subdivisions in national forests. Sierra Pacific Power Co. has attempted to do this within the framework of of existing costs. It approaches the area with conventional 14.4-kv construction. Every effort is made to follow natural clearings to reach the load area. Here a transformer is set and the poles stop! From this point on, aerial cable, nature's own trees and tree line hardware complete the service.

The hardware is the result of an ingenious combination of standard transmission and distribution components by Sierra Pacific engineers. "It has more swivels than Elvis—and that's just what you need in a high wind. We only trim a two-foot clearance, and after several years' operation under severe storm and snow conditions we have had no line failures." Cost of the hardware is less than $4 and all parts are readily available.

To date, it has been possible to bring the primary within 240/120-v range of the homes. However, the same scheme is possible at greater distances using 480-v secondaries and setting dry-type transformers near or on the customer's premises to give 120-v service.

"The success of these tree lines leads us to believe that this distribution technique might be desirable in other heavily wooded tracts," a company engineer said.

Primary ends at pole-mounted transformer. Here tree lines take off to three users



Conventional System

Gives Steam Plant Efficiency

M. D. Liechty, Market Development, Leeds & Northrup Co.

A new concept of combustion control will be going into service shortly on five CE-Sulzer monotube boilers, two of which are for supercritical pressure operation.

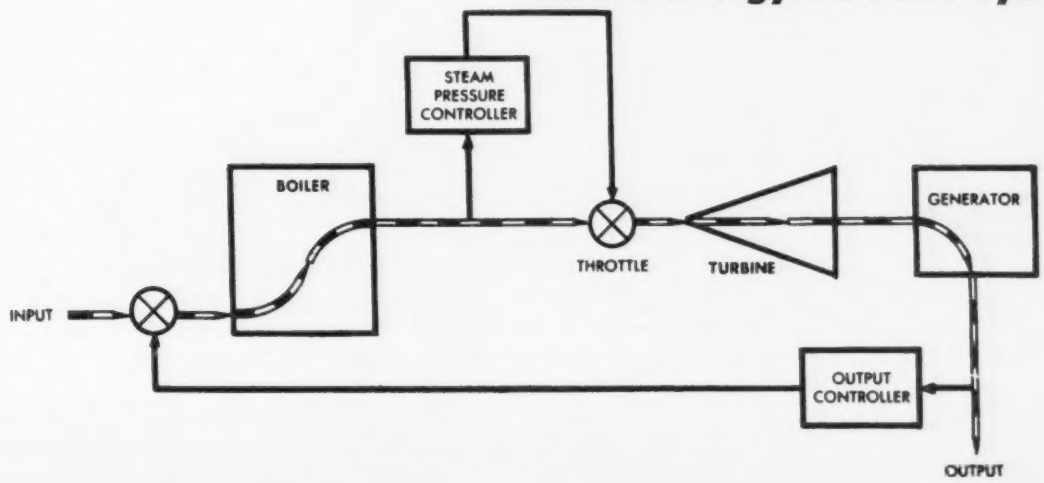
Basically, this control system, called "Direct Energy Balance," controls these power plants as integrated units rather than as independent components (boiler, turbine-generator, etc.), each with its own independent control loops. Changes in output are accomplished by changing input, resulting in a coordinated control which insures keeping the boiler-turbogenerator always in step with each other.

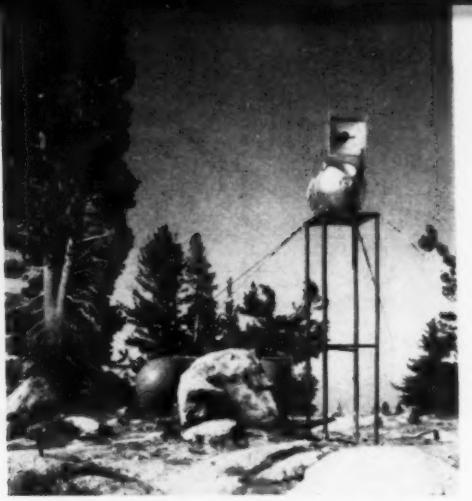
Sketch 1 shows the conventional method of control, which has been used satisfactorily for many years. It is apparent from this sketch that there are two distinct and separate control "loops"; one for the turbogenerator to regulate output and the other for the boiler to match boiler output to load demand. As boiler storage capacities have declined over the years, this conventional combustion control system has often been supplemented by auxiliary or anticipating signals from steam flow, generation, governor motor anticipation, etc., in an effort to keep the boiler firing rate in balance with electrical demand. The advent of the once-through boiler design with its lower storage capacity and turbine by-pass system has necessitated a fresh look at this problem of coordinating the boiler and turbogenerator. This resulted in the concept of Direct Energy Balance control, shown on Sketch 2.

In principle, with the DEB system, boiler input is matched directly to electrical demand with steam pressure regulated by the turbine throttle. In order to permit drawing on stored energy in the boiler for rapid load changes, the control is arranged to bias throttle steam pressure on load changes. This enables the unit to regulate as rapidly as possible, but always in a controlled fashion.

This new concept in plant control has been under test for approximately a year in a conventional pulverized coal fired plant. Extensive simulation studies have been made to assist in determining the optimum arrangement and control adjustments. So, the successful development of the Direct Energy Balance control system may also allow the development of the full potential of the once-through boiler.

Direct Energy Balance System





On top of the world and inaccessible for nine months of the year is the microwave-controlled cloud-seeding station. Notice bracing to protect from snow and high wind

Southern California Edison uses microwave control to get . . .

Push-Button Precipitation

W. A. Lang, Chief Hydrographer, Southern California Edison Co.

One of the most important considerations in setting up a cloud-seeding program is the location of the ground based silver iodide generators. A major obstacle in conducting cloud-seeding studies at the higher elevations of the Sierra Nevada Mountains is that the best generator sites are inaccessible during the winter months. This obstacle, which has challenged Southern California Edison Co.'s hydro generation division, was overcome by using self-contained generators triggered by microwave.

Remote Equipment

In 1957 North American Weather Consultants of Santa Barbara designed remote controlled silver iodide generators that could be operated by microwave. With this equipment available, it was possible to use Edison's microwave facilities in the High Sierras for controlling the operation of two additional silver iodide generators remotely located at elevations of 7,500 and 10,600 ft. During the winter months, the operational period for the weather modification experiment, these two sites are inaccessible except by snowshoes, skis, sno-cat or helicopter.

These two remote controlled silver iodide generators were installed during October 1957 by North American Weather Consultants with the assistance of the communication division of Southern California Edison Co. Care was taken so that they would not be buried by snow or destroyed by high winds. Each generator is supplied with 1,000 gal of pure propane gas and 55 gal of 2% silver iodide solution. These supplies allow for generator operation of approximately 550 hours, or the whole nine-month "snowed in" season. The generator operation itself consists of the propane gas forcing the silver iodide solution under pressure through an atomizing head to be burned with a propane flame. The vapor is quenched by the much cooler surrounding air and the resulting sublimation of the vapor forms small particles of silver iodide.

Startup Operation

The operating procedure for the remote controlled generator begins when the meteorologist of North American Weather Consultants notifies the plant operator at a Big Creek power house to start the gen-

The Edison Cloud-Seeding Experiment

In January 1951 the Southern California Edison Co. began an experiment in weather modification to determine the possibility of increasing the winter snowfall in the upper San Joaquin River watershed. This experiment, which is now in its ninth season, will be continued until such a determination can be made. The difficulty in assessing the effectiveness of cloud seeding is that an increase or decrease might be masked by overriding long-term cycles or trends.

erator. The operator closes the switch at the power house, initiating a tone transmitter that sends out a tone of 4.0 kc. This tone is sent by cable to a relay point and from there to the generator sites by microwave on 960-mc frequency. At one nucleolating generator site the tone is picked up by a selective tone receiver and operates a relay which closes the power circuit switch. This power circuit is operated on 110-v a-c, which is supplied by power lines, or by a stand-by generator. The operation of the other nucleolating generator is similar except that it has a supervisory control panel which receives the steady tone signal. This signal operates a relay that closes the switch on the battery power supply circuit.

Burner Controls

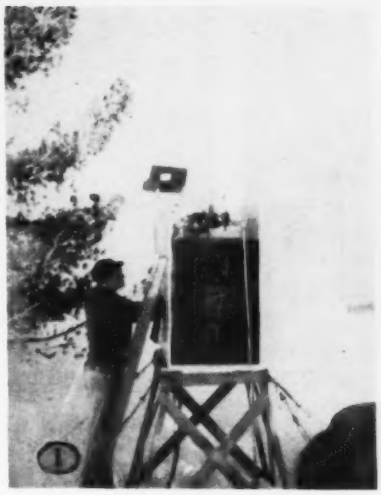
When the power circuit is energized the valves of the silver iodide tank and propane tanks are opened and the time meter is started. It also energizes the primary of a stepdown transformer whose secondary load is a glo coil. When this transformer is energized a relay is operated which sends a tone signal back to the Big Creek power house over the microwave. This tone signal operates a relay that lights a signal lamp.

The glo coil ignites the propane gas at the burner. The heat from the burner opens a thermoswitch in the transformer circuit, de-energizing the circuit and opening the relay that had operated the return signal circuit. The signal lamp then goes out. This thermoswitch operates about five minutes after the burner is lit.

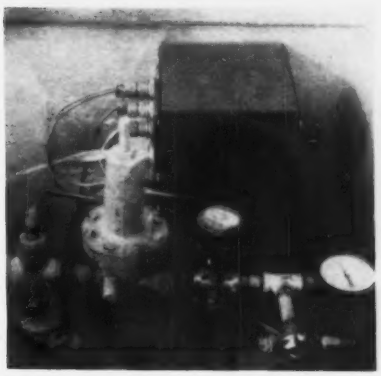
If the burner should go out, the thermoswitch would close and the signal lamp would go back on. Also, the transformer circuit would be re-energized which would relight the burner. If the light remains on after 10 minutes, it is assumed that something is wrong and the generator is shut down.

Shutoff Operation

If the operation is normal, the generator would remain on until the plant operator is instructed by the contractor's meteorologist to stop the operation. This is done by opening the switch at the Big Creek power house, which breaks the original tone circuit and opens the relay that interrupts the power circuit. This immediately closes the silver iodide tank valve as well as the electric time meter. The propane valve closes through a time delay relay that allows 180 seconds for the acetone solution in the piping to be burned, thus preventing a deposit growth around the atomizing head. The flame goes out when the remaining gas is burned and the thermoswitch closes, leaving the equipment ready for another operation.



1. View of the remote controlled silver iodide generator with the enclosure opened



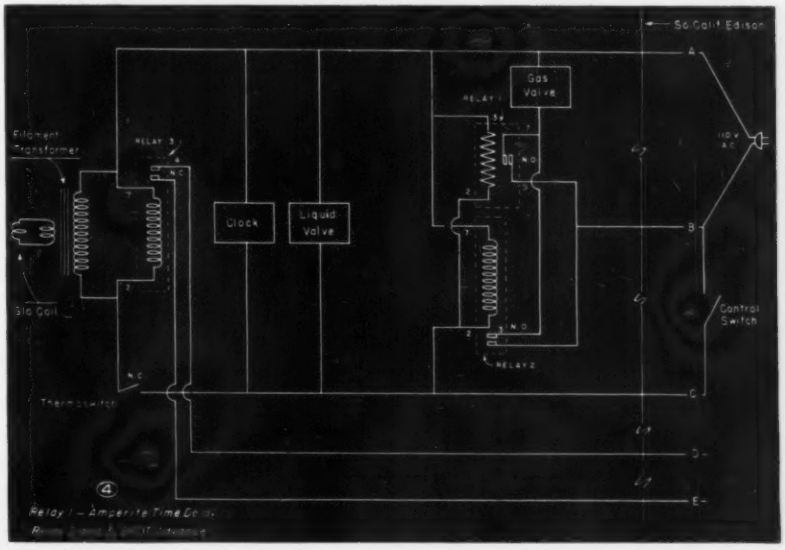
2. View of control unit, gas valve, pressure regulator, security valve on iodide generator

3. Close-up view of remote control unit and electric timer on remote controlled generator

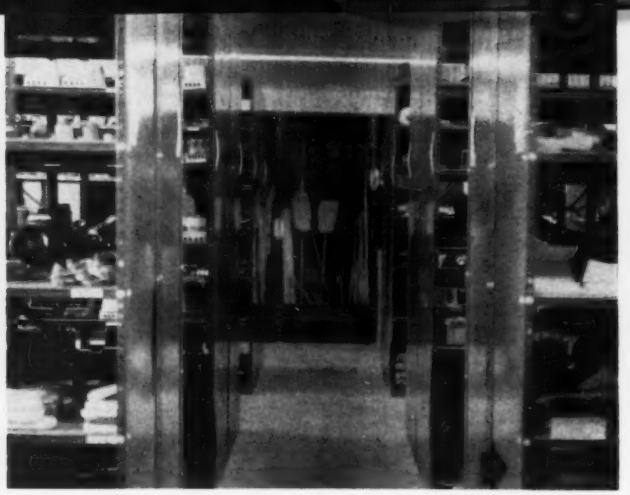
4. Control circuit for remote s-i generator. The requirement for 60-cycle power, normally supplied by power line or stand-by generator

Weather Playback

The Edison Co. has also installed equipment to microwave wind direction, wind velocity and hours of sunshine from one of the sites to one of the Big Creek power houses, where it will be continuously recorded. The data will be helpful in scheduling future operations of the remote-controlled generators.



1. Scrap material from the entire system is received at the department's central salvage facility. It is sorted, graded and disposed of in one of the methods described on these pages



2. Small items, valued under $50, are sorted, priced and placed on sale in the retail sales outlet. This facility enables the department to realize a return from items otherwise unsalable

Here's how the Los Angeles Department of Water & Power recovers $417,000 as . . .

Savings From the Scrap Pile

Clayton M. Allen

Engineer in Charge of General Plant Division
Los Angeles Department of Water & Power

Last year the salvage operations of the power system of the Los Angeles Department of Water & Power paid all of its operating expenses—including 13 employees—and saved the department $417,000.

Salvage operations at the Department of Water & Power date back to 1916 when the department foresaw the need to establish a salvage facility to handle the scrap material that was being returned from the system.

In 1931, the board of water and power commissioners of the Department of Water & Power authorized the general manager and chief engineer to appoint a salvage sales committee, composed of five men selected by the general manager from the several divisions of the department, with the engineer in charge of the general plant division of the power system as chairman. This group created two obsolete materials committees, one for the power system and the other for the water system. This article is concerned only with the salvage operations of the power system.

The obsolete materials committee is charged with the job of turning over to the salvage operation all equipment and material that have passed their useful life in service, as well as warehouse items that are no longer economic to stock. This committee consists of engineers for their technical advice, maintenance and construction personnel for their practical viewpoint. The stores superintendent acts as chairman.

Four Salvage Channels

With an eye toward gaining the maximum return on salvage material, there are several methods of disposal.

1. In the case of material and equipment valued under $50, the stores superintendent is authorized to sell, as is, through a retail salesroom outlet. Typical of equipment sold in this manner are used brooms, switch boxes and some types of copper wire.

2. Bulk items segregated and sold on bid to salvage dealers.

3. In some instances, such as with insulated wire, the value of the bare copper greatly exceeds the value of the insulation, and it has been proved economic to process the insulated wire by burning off the insulation prior to selling the copper.

4. Another method of the salvage operation is the reclamation and processing of material so that it can be reissued to the system. During last year, 441,123 lb of wire of irregular lengths were spliced into standard lengths and returned to the system. In addition, 31,000 lb of tie wire were cut for use on the system and

3. Quantities of bulk material such as tires, brass, stainless steel, etc, are segregated and bids are taken for their disposal from commercial salvage dealers

4. For a large quantity of scrap processing is required for maximum salvage value. Such a material is insulated copper wire, which accumulates at the rate of 40 tons per month. In order to remove the insulating material, the department prepared drawings and specifications for an incinerator that would at one time dispose of the accumulation of combustible rubbish, and burn the insulation from the copper wire. The incinerator consists of a three-chamber unit with the smoke from the insulation-burning chamber passing through the rubbish-burning chamber and finally through a series of baffles into a high temperature gas-fired chamber where any smoke is completely consumed and then up a 60-ft stack. The copper-burning chamber has a capacity of 6,000 lb of wire per shift

---

88,211 ft of wire were metered and rereeled for further usage.

The accompanying photographs, in the main, illustrate the equipment and the kinds of operations that enable 13 salvage employees to process for sale approximately 1,307,000 lb of ferrous materials and 1,304,000 lb of nonferrous materials per year.

Savings Mount

With an income nearing the half-million-dollar mark, the department officials are surer than ever that the concept of taking savings from the scrap pile is sound indeed.

---

5. After 25 minutes in the combusion chamber the pallet is placed in a bin where a stream of water cleans off the ash and at the same time cools the copper. Surprisingly enough it was found that the ashes that are washed off have sufficient copper content to be commercially salable

6. The clean copper is finally baled for sale at the market price, a much more valuable product for having been processed

7. Short lengths of usable wire are spliced into standard lengths and returned to the system. Some of them are cut to size for tie wires, accounting for an over-all economy in wire use

8. In another reclamation operation a machine was developed to strip the lead from lead-covered cable. The lead is sold to the water system for use as a caulking material while the inside insulated wire is reclaimed in the incinerator

Almost unnoticeable from a distance, the service drops in this area would require regular and costly tree trimming to maintain service. Above, close-up shows how armored cable is threaded through branches

SMUD standardizes on armored service drops to . . .

Beat the Tree Trimming Problem

W. H. Howe
Distribution Engineer
Sacramento Municipal Utility District

The tree problem is not a newcomer to the distribution field. An area already blessed with an abundance of trees, plus the energetic efforts of thousands of new homeowners, makes the tree problem particularly pressing in the Sacramento Valley. Tree trimming expenses in this area have doubled in the past three years. For these reasons, the district's carefully planned cycle of tree maintenance is hard to maintain.

This problem, coupled with an increasing demand for quality service, has resulted in the adoption of *armored service cable as SMUD's standard residential service drop.* Rather than use valuable crew time in trimming trees for services, they will be free to trim primary and secondary lines. By using crews to maintain the more important distribution lines, the district will realize a saving. Local outages are reduced by using an armored cable.

Experience with unarmored drops showed few cases of conductors burning down in trees. "Shorting" services, however, have caused many transformer fuses to blow. The location and repair of the offending service is a time-consuming and costly job; especially when tree trimming is required to reduce the possibility of another outage. One solution would be to remove the objectionable tree or control new plantings by property owners. This plan is not particularly attractive. Unfortunately, many homeowners consider the area under and near service wires very desirable for their horticultural activities. Along with an improvement of local outages are the side benefits of reduced power loss because of tree contact, and, of course, the armor tape on the cable reduces the possibility of power theft.

The first cable was installed about three years ago, has shown no signs of abrasion or corrosion wear. In general, the cable is self-clearing of trees. The accompanying photographs show the second installation, a small subdivision constructed in an orchard. This installation was more extensive so as to obtain experience and costs in using the cable. It is evident that the cable makes a neat installation.

Prior to the use of armored cable, the standard service for new construction was three weatherproof aluminum conductors, two No. 2 with a No. 4 neutral. The cable consists of two No. 2 aluminum conductors with the aluminum armor tape being the neutral, equivalent to No. 4 aluminum. The insulation is neoprene and has stood up very well. As can be seen in the photographs, simple compression connectors and a basket-weave cable grip make for rapid installation. The installation of the services was rotated among our service crews so as to familiarize them with the new material and to enable them to offer suggestions for improvement. Their comments were very favorable. The storage and handling time of the new conductor over the old is considerably less.

An economic comparison of the two methods was made and the results were near the break-even point, slightly in favor of open wire. In view of the many intangibles associated with the study, which could not be evaluated accurately, the cable was adopted as the standard. The comparison was drawn without attempting to project future tree trimming requirements and without giving any weight to forecast increases in power consumption.

Last of this series—V

Applying Ground Transformers

Tom Hughes
Electrical Safety Engineer
California Division of Industrial Safety

Earlier in the text, we stated that "if the grounding transformer is properly applied it helps to correct the aberrations of the main transformer." In Fig. 3, we deliberately pictured the grounding transformer close-coupled to the secondary winding of the main transformer. Obviously, if the currents represented by the arrows in Fig. 3 are to be exchanged effectively, close-coupling is the ideal setup.

Theoretically, the grounding transformer is properly applied if we think of it as a tertiary winding (or windings) on the same core as the other windings of the main transformer. Practically speaking, of course, it must be on the load side of the service switch (or circuit breaker) to satisfy the codes, if it is owned and maintained by the customer. Of course, if the service equipment is in the primary feeders (ahead of the main transformer) we can tie the grounding transformer right on to the secondary terminals of the main transformer, where it should be.

Stating it another way, for ideal application, the grounding transformer must be construed with the main supply transformer, as to impedances, rated long time load, rated momentary fault current, etc. As it was originally used in plants, only to obtain a ground on a 480-v delta system, it was correctly applied.

Now, however, people are getting all kinds of ideas for using grounding transformers in plants and the setup illustrated in Fig. 6 is a common proposal. Since all they think they want to do is obtain a neutral for their 277-v lighting systems and the lighting system is only going to use a small percentage of the total plant connected load, why buy a grounding transformer large enough to ground the whole system?

Now, let's take one more look at the nature of the problem before answering this. The grounding of equipment has been a bone of contention for a generation and the main purpose of equipment grounding is to carry away fault current fast enough to prevent the potential of the exposed case of the raceway or equipment from reaching a level that is dangerous to persons coming in contact with it. Construed as an ideal system of electrical installation, the ground or raceway system would pass enough current from a fault to trip the overcurrent protection and take the faulted portion of the system off the line.

Of course, we know that this seldom happens. The average ground fault is usually of an arcing (sputtering), high-resistance nature and the impedance of the raceway fault return path of the feeders supplying the fault current and (possibly), even that of the supply transformer, is such that not enough fault current is passed to trip the overcurrent protective device. Thus, we are used to thinking in terms of ground faults (on a normal 480-v system) as a long-term nuisance.

However, when we apply a grounding transformer to the system we are going to have to revise our ideas about fault grounds. A grounding transformer, by its very nature, helps fault currents to flow instead of impeding it. If the main service switch (or circuit breaker) is loaded up and there is good raceway continuity to the point of fault, it may take the whole plant off the line. In some plants (such as refineries, chemical plants, etc.), the nature of their operations would make it a distinct hazard to remove the electrical supply suddenly. This is why many plant engineers demand an ungrounded system in their plant and employ ground detectors and adequate maintenance personnel to keep it that way.

So we see that there may be some valid reasons (other than the initial cost of a larger grounding transformer) for applying this transformer only on a feeder circuit. See Fig. 6. But we must remember that one of the goals in its design is to maintain a stable neutral. If the grounding transformer is not of a reasonable capacity or its impedance is not properly matched with that of the supply transformer, a heavy fault will surely produce momentary displacement of the neutral with consequent hazard to the lighting equipment.

There is one sure solution to this problem, though. If we want to do a proper job with a grounding transformer we can always employ sensitive relays to operate its line circuit breaker. Fig. 7 illustrates a protective setup for a small grounding transformer (say for 50 kva of lighting load) applied only to obtain a neutral for 277-v lighting, as shown in Fig. 6.

The feeder breaker for the lighting load is a type having both thermal and magnetic trip, and auxiliary terminals for actuating its trip mechanism by an external relay circuit. The ground detector relay, shown on the grounding conductor at the bottom of Fig. 7, is the device that takes it off the line in the event of any flow into the transformers from "ground" or the conduit system. Actually, it is similar to the reverse-flow relays (known as "back-up relays") used between transformer banks or in tie-points of loop systems.

We see that currents flowing from the neutral to the transformer (such

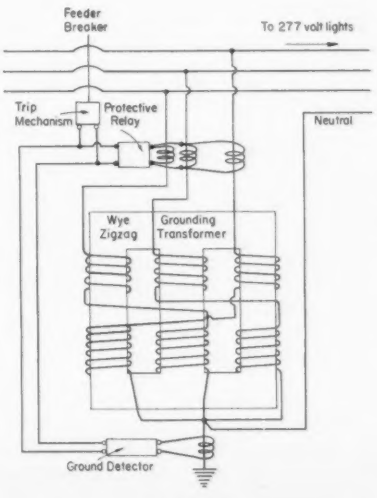


Fig. 7

as load unbalance and third harmonic) will by-pass this ground detector relay. You will remember that third-harmonic currents from the three phases are in additive phase sequence when all three phase loads are balanced. You will also remember that the nature of the winding (coil) disposition in a grounding transformer is such that it tends to modify or equalize unbalance flow from the neutral, through the transformer, into the three feeders.

Thus, the currents produced from the three current transformers on the load side of the circuit breaker will normally be in proper phase sequence and fairly equal and no operation of the protective relay will be indicated. On the other hand, should a portion of the grounding transformer winding become shorted or grounded, it is obvious that a balanced state could no longer exist and this protective relay would open the feeder breaker. It should also be obvious that no malfunctioning within the lighting system or transformer would affect the ground detector relay—so the need for the line protective relay, also, is indicated.

We shouldn't have to point out that the feeder breaker, ahead of this grounding transformer, must have a fault current interrupting capacity commensurate to the initial fault current available from the main supply transformer. This current could be anywhere from 20 to 30 times the continuous duty current rating of that transformer, depending on several variables.

In general, it is well to consult with the manufacturer of a grounding transformer (as well as the utility company) on its application. Some manufacturers place a rating plate on the grounding transformer that indicates the nature of the line supply transformer it must be coordinated with. Thus, rather than giving the continuous current rating of the grounding transformer, it shows the continuous rating and impedance of the supply transformer it is to be connected to.

In connecting the grounding transformer to the line, the connections to the three-phase conductors may be one-third of the current-carrying capacity of the phase conductors to the load, since they carry only unbalance current. The whole design of the grounding transformer is predicated on a maximum fault current duration of 10 seconds. By that time, the ground detector relay should have tripped the breaker between it and the supply transformer or, in some cases, the ground detector relay may trip a primary breaker which removes the supply transformer from the line.

The current-carrying capacity of the neutral must be equivalent to that of the phase wires supplying the load, since the sum of the third-harmonic currents may overheat it if it is smaller. The connection to ground must also be as large as the phase wires to the load, to maintain a low-impedance ground path. Some authorities want it two or three times as large.

Since grounding transformer practices are a carryover from its origination in utility company applications, there remains a question in the minds of some people as to the use of resistors or reactors in the ground connection. When used on high-voltage systems the ground is connected through a resistor. When used with a generator, the ground is connected through a reactor. But, on any 480-v system, the wye point of the grounding transformer should be solidly connected to ground.

It goes without saying that the neutral conductor must be brought out of the transformer case (assuming a dry-type transformer) through the same opening with the three-phase conductors and carried with them through the same gutters or raceway system.

Choice of Transformers

We started out with the use of a wye-delta grounding transformer and worked our way around to a wye-zigzag, commonly known as just a zigzag. As we tried to show, the electrical characteristics of the two are about the same.

On the other hand, the zigzag can be made for less money and it is smaller in size and lighter in weight. The winding space and core size for the wye-delta must be 1.73 times as large. The only reason for using a wye-delta transformer as a grounding transformer is that you happen to have one on hand.

There is one thing to watch with a wye-delta, however. If the ratio of the windings is such that the voltage is stepped up to high voltage in the delta winding, it must be treated as any other high-voltage transformer. That means that the external exposed terminals must be removed or it must be stationed in a separate vault or enclosure that will prohibit entrance by ordinary personnel and the entrance must carry a high-voltage warning sign.

We have spent a lot of space talking about grounding transformers and their use but now we want to see if their use is really justified. Actually, they have been used mostly as a stopgap measure to get the 277-v lighting system into popular use and there should be a rapid decline in their use, except as a means of obtaining a system ground in an old plant.

The larger utility companies are about ready to start furnishing four-wire star services to new users of 277-v lighting. This, of course, will remove the need for a grounding transformer. But even in a plant with 480-v delta supply, the economics will hardly justify the purchase of a grounding transformer just for 277-v lighting.

By the time you buy a special circuit breaker for the feeder and the special relaying equipment, you may have spent more than the price of an ordinary one-to-one, delta-wye transformer. And you can use small delta-wye transformers at any location that is convenient, without regard to fault current originating on their line side, assuming that you provide them with the normal primary overcurrent protection.

For normal operation of a plant, where an outage is not a hazard, operating with a grounding system is desirable for several reasons and, in the long run, will usually prove more economical. Discussion of all the factors involved would be out of place here. But, where it is desired to ground the over-all plant system and the existing main (delta-secondary) supply transformer serves only the one plant, the use of a grounding transformer is justified.

Of course, as we showed before, no metering equipment or other vulnerable equipment should be inserted between the grounding transformer and the main supply transformer. And, regardless of where the service disconnect is used (ahead of the main supply transformer or between the two) it must be a three-pole circuit breaker with high interrupting capacity.

Another series on the misapplication of motors and controls is being prepared by Tom Hughes for our readers because, as an inspector, he has seen such gross mistreatment of such equipment, which must be due to misunderstanding or ignorance. Rules in the codes do not recognize the problems involved. Therefore, as in the two previous series of articles by this practical engineer and inspector, the contractor, inspector and engineer will find much valuable field information and experience. The previous articles on the confusion in grounding and the series concluded here on zigzag transformers have earned well deserved compliments.—The Editors.

ELECTRICAL WEST
Construction News

For
- contractors
- consulting engineers
- lighting engineers
- wiring designers
- distributor salesmen
- all interested

The troublesome hiring hall question, or how to conform to the Taft-Hartley Law in the electrical construction field, has stalemated National Electrical Contractors Assn. compliance because the unions resist even their national officers' advice. It is to be the subject possibly of greatest interest at the forthcoming NECA convention in Dallas Nov. 22. Jerome D. Fenton, NLRB general counsel, will appear to explain the policy to the contractors.

In building his own new home on Point Loma, sales-minded Norman Ferguson, president, California Electric Works, San Diego, is leaving nothing electrical out of the plans. There will be 338 outlets, 229 of which will be for lighting fixtures, most of which are on a low-voltage master system and with many on dimmer control also. Pictured at (1) are the circuits coming into the main control center. Ferguson does well to take the plan to trace them.

When Yosemite Chapter of Illuminating Engineering Society received its charter from Regional Vice-president Carlton Thompson of San Diego Sept. 16, the shade of the late lighting genius of the San Joaquin Valley, Carl Wolf, must have smiled. (In the picture C. W. Macy, Golden Gate Section chairman; Carlton Thompson; I. N. McMath, chairman of the Yosemite Chapter; and Jack Hammond, dean of the lighting field --(2) ''Kelly'' Courtright and Emery Wilson, too, both of whom furthered lighting as few executives do, must also have given the new chapter their blessing. Contractors of the valley profited greatly from the leadership of these men.

Frustrated in getting a state electrical law in the past, Lorin Christensen, Salt Lake City chief inspector, told the Utah Chapter, IAEI, that proponents of a state fire marshal's law had invited the inspectors to participate with them by combining a state electrical law with it . The Utah Chapter will look in the matter.

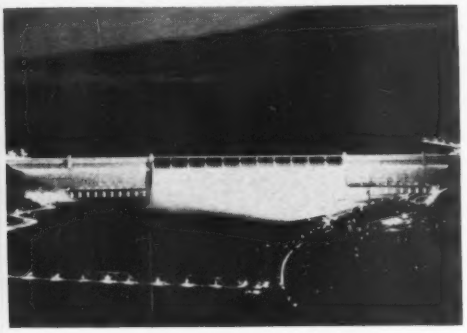
The really hard workers at a convention, the convention committee, are often crowded out of the report of that meeting. So in picture 3 thanks are extended to A. J. Hund, senior electrical inspector, Anaheim, general chairman for the Southwestern Section, IAEI, meeting, and his local team: Vern C. Blum, electrical inspector, Costa Mesa; R. N. Finfrock, electrical official, Santa Ana; and Walter F. Reed, supervising electrical inspector, Orange County.

Wage scale awarded to the union at Las Vegas by the Council on Industrial Relations of the contracting industry was $4.05 per hour with an increase to $4.20 on July 1, 1959. . . A new scale also went into effect Nov. 7 in the Local 684, IBEW, area of Stanislaus, Tuolumne, Merced and Mariposa Counties. The scale increased 25¢ per hour to $3.55 plus 10¢ health and welfare and 4% vacation.

1

2

3



4

A new chapter of NECA known as the Kern County has been established in Bakersfield with 18 members. President and governor of the chapter is R. F. Vincent of Jim Baker Electrifier. William G. May is manager and the office is at 1421 24th St., Bakersfield.

Four counties are now covered in the area of the San Joaquin Valley Chapter, NECA, with headquarters at 1521 W. Oak St., Stockton, and for which George W. Flint is manager. They are San Joaquin, Tuolumne, Stanislaus and Merced Counties. Glen Bockmon of Bockmon & Womble is governor and J. E. McCarty president. A job management course of 33-week total has been running for the past 20 weeks, each Thursday night for two hours, at the NECA headquarters in the Builders Exchange with a good attendance. Similar courses may be run in other counties, although members have been coming from Modesto and Merced to the meetings.

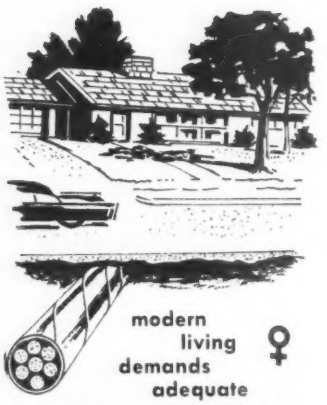
5

Grand Coulee Dam spillway is now illuminated by 742 General Electric 1,500-w floodlights that were installed by West Coast Electric Co. of Seattle. The system provides color changes on the dam every 5 to 10 seconds to make an uninterrupted 30-minute display (Fig. 4).

Two secretaries (Fig. 5) who do much to further the Northwestern Section, IAEI: Jim Backenstos, of the Portland inspection staff, secretary of the Oregon Chapter, furnished us the report on the Northwestern Section meeting at Billings; although retired, Bill Gaffney of Tacoma was re-elected secretary-treasurer of the Northwestern Section, which he has served many years.

Estimating workshops put on by national staff members of NECA are scheduled in the Northern California Chapter Dec. 8 and 9 in Oakland for the Alameda County branch and Dec. 11 and 12 for the Contra Costa branch.

6



High-frequency fluorescent lighting promises much advancement with a new development of transistorized high-frequency power sources by Westinghouse Electric Corp.'s Lighting Division. Pilot types are supplying power at 1,500 cycles to 64 standard 40-w rapid start fluorescent lamps in Westinghouse offices and when all the details are worked out commercial units will be developed. The power packages measure 5x4x19½ in., weigh 11 lb and deliver up to 1½ kw at 150 v, peak. Ballasts weigh only a few ounces compared to the regular ballasts. Up to now high-frequency systems had to rely upon rotary frequency changing sets.

For five years inspectors have questioned the use of the green wire on ballasts of fluorescent fixtures because it is not at ground potential and seems thus to be a violation of Sec. 2112 of the National Electrical Code. A recent official interpretation declares that this is not in violation of the code.

To help them sell adequate wiring the Copper & Brass Research Assn., 420 Lexington Ave., New York 17, offers electrical contractors professionally prepared ad mats in one- and two-column sizes with the headline "Modern Living Demands Adequate Copper Wiring" (Fig. 6). These have been mailed to publishers of more than 1,500 small daily and weekly newspapers with the idea that the local contractors may want to run them.

Park Forte turned over the Northwestern Section, IAEI, presidency to James Paxton of Spokane as other officers looked on

Changeable circuit breakers and type S fuses arouse

NW and SW Inspector Meetings

Both the proposed new code and association economics concerned the two annual meetings of the International Association of Electrical Inspectors—the Northwestern Section at Northern Hotel, Billings, Mont., Sept. 15-17, and the Southwestern Section at Disneyland Hotel, Anaheim, Sept. 22-24. Although separated by distance and different local conditions, both voted on three phases of circuit protection—the mandatory requirement for the type S "nontamperable" fuse and a corollary squelching of a trick device for removing them; the limitation of circuit breaker interchangeability; and the recognition of high interrupting capacity service equipment on network systems. In general no fault was found with the changes proposed for the next edition of the National Electrical Code.

Both sections voted the proposed change in the articles of association which will raise the dues of active members to $10 a year, create a class 1 associate with the same dues for journeymen, wiremen and small contracting shops. The associate dues go to $15 per year and there is a regrouping of the type F or city membership for a minimum of $25. These increases are necessary to maintain the IAEI on its new, more independent basis with its own secretary treasurer, Everett Cogan, and its own Chicago headquarters office.

James Backenstos, Portland electrical inspector and secretary of the Oregon Chapter, was asked to report the Billings meeting. Excerpts from his report follow:

Northwestern Section—Billings

A straight from the shoulder talk on "The Electrical Inspector, His Qualifications, Responsibilities and Compensations" was the outstanding one of the Northwestern Section 32nd annual convention. It was given by Merwin W. Brandon, chairman, National Electrical Code Correlating Committee and vice-president, Underwriters' Laboratories Inc.

Brandon stated that the electrical inspector should have the following qualifications: integrity, leadership, should not be easily swayed or pressured, should be fair, intelligent, carefully weighing all decisions, should have an impartial attitude, good personal appearance, good personality, no loss of temper, and knowledge of electricity. People have confidence and listen to a man who makes them feel that he knows what he is talking about. Electrical safety to life and property should be of utmost importance to the electrical inspector.

First of all he must be sold on his job. This will cause him to do things with the public interest at heart. He must be a good salesman, always upgrading electrical installations. He must never resort to dictatorship, for democratic procedure is progress, and good public relationship is established through applying the old golden rule: "Do unto others as you would have them do unto you."

Brandon then raised the question

Head men in IAEI—Seated: William Gaffney, Northwestern Section secretary; Park Forte, president; Dewey Johnson, Atlanta, IAEI president; standing: Hal Morr, past president; Eldon Shirley, Billings, general chairman; Everett Cogan, IAEI secretary-treasurer, Chicago; Joe Gray, vice-president, who led the code panel discussion

President Park Forte of Boise asks Bill Volheye, Oregon state inspector, about it

Two presidents—Dewey Johnson of Atlanta, IAEI national; Barney Alverson, San Bernardino County, Southwestern Section leader

of how to get and hold this type of man. Answering his own query, he said that his pay should be on a level of those whose work he supervises. Some cities have brought inspectors pay up to that of journeyman-wireman scale. Cities must do this if they want top-rate personnel. He advocated that local committees should be formed to work out a more adequate pay plan for electrical inspectors.

The convention was presided over by Park Forte, Boise city inspector, Northwestern Section president. IAEI President Dewey Johnson of Atlanta, Ga., informed members on the financial and legislative condition of IAEI and of the steps that must be taken to bring it on an even keel financially. Later IAEI Secretary-Treasurer Everett Cogan went into further detail before the vote on the articles of association. Active members, he pointed out, do not begin to pay for the service extended to them under the present $6 dues. Past President Hal Morr, Salt Lake City, further amplified on this problem. As a result the changes were voted unanimously except for one dissenting vote.

Two other speakers addressed the assembly. Victor S. Vaughan, Spencer-Thermostat Division of Metals & Controls Corp., discussed the cause of motor burnouts and the use of inbuilt thermostatic protection to prevent them. Roger Keith, assistant chief engineer, Electrical and Chemical Division, Kaiser Aluminum Inc., had intended to talk on aluminum conductors but the Oregon Chapter minutes of The Dalles meeting published in the *News Bulletin* covered that part of his talk so extensively that he spoke only on connectors and lugs used in conjunction with aluminum conductors.

Code discussion is always the main object of the meeting. The code panel was moderated by Joe Gray, chief electrical inspector, Portland, who had prepared an analysis of the proposed changes in the 1956 National Electrical Code to be used in questioning various proposed changes. He appointed to a panel E. M. Tubbs, Bellingham inspector; H. H. Watson, G-E Co.; W. R. Volheye, Oregon state inspector; Frank Stetka, NFPA; Kent Stiner, BullDog; James Paxton, Spokane inspector; Orval Melby, Yakima inspector; and Mark Lundy, Idaho state inspector.

Some of the more important code proposals discussed and views on them follow:

1. Deletion of the fine print note following Section 2452 to make use of type S nontamperable fuses mandatory was favored.

2. Sec. 2542, Equipment Grounding (not in NFPA proposals)—The Northwestern Section went on record that where nonmetallic sheathed cable is used with a grounding wire as an integral part of the cable that these boxes be grounded."

Volheye called to attention a device on the market put out by Trico Fuse Mfg. Co., which is used to back out type S "non-tamp" fuse adapters. This defeats the progress made over a 17-year period. This device or "gimmick" is called Extracto and the Northwestern Section went on record as strongly opposing its usage or sale.

3. Interchangeability of circuit breakers was discussed and the fact that no change is proposed in the code about them. Gray pointed out that where the interchangeability of circuit breakers took place in large buildings in Portland, Ore., the changing of breakers was sadly abused. Larger breakers in panels caused overprotected circuits. It was expressed that the ordinance adopted by Chicago was possibly due for a "brush off" from NEMA and that a definite "road block" to keep it out of the 1959 National Electrical Code was being laid.

4. The grounded blade of the grounding type cap is not polarized. Also why have blades the same width? There was argument to the effect that the grounding-type cap can only go in one way with the grounding prong as an integral part of the cap.

But if the grounding prong is broken off so as to plug in without it the UL label may be nullified, but the hazard is still there.

5. It was pointed out that there is a definite need for a 40-amp branch circuit to supply fixed lighting only. At the present time there is only the 30-amp and 50-amp branch circuit to supply fixed lighting using heavy-duty sockets. Design engineers are continually laying out fixed lighting in industrial plants using No. 8 wire to feed mercury-vapor lamps. This now is a violation of National Electrical Code. It was the concensus that there was no harm in utilizing a 40-amp general-use branch circuit of this type to supply fixed lighting, but *that such circuits should not supply portable appliances.*

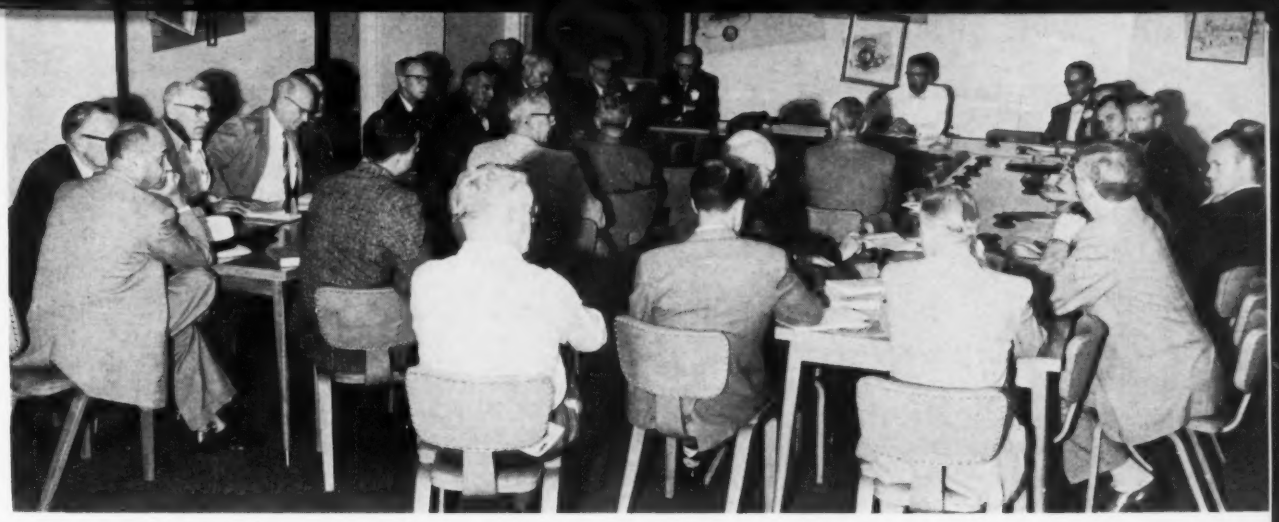
In the election of officers that closed the meeting, the following were elected for the year 1959:

President, James Paxton, Spokane city inspector; first vice-president, Ed M. Tubbs, Bellingham city inspector; second vice-president, Joe F. Gray, Portland chief city inspector, and secretary-treasurer, W. L. Gaffney, retired, Tacoma.

The executive committee includes: Eldon Shirley, Billings, Mont.; Loran Christenson, Salt Lake City chief electrical inspector; J. D. Gawne, Seattle City Light; J. Hyde Stayner, Utah Power & Light Co.; Tom Widrig, General Electric Co., Seattle; B. A. Travis, consulting electrical engineer; Park Forte, Boise city inspector.

The Executive Council: Cliff Atkins, Oregon electrical inspector; W. R. Volheye, Oregon chief electrical inspector. Utah Fire Rating Bureau: first alternate, H. S. Morr, Salt Lake City, Fire Rating Bureau; second alternate, Joe Gray, Portland chief city inspector; third alternate, Ed Tubbs, Bellingham city inspector.

High praise was extended to the host, the electrical industry of Montana, for the wonderful banquet and entertainment, and the excellent arrangements, plus the two special tours, one of which was to the Carter Oil Refinery, and the special scenic tour.



Code workshops featured the Southwestern Section—this one the Residential, with Robert Fassbender, Phoenix, as chairman

The committees who were responsible for making this one of the outstanding Northwest Section meetings: Local committees—Eldon L. Shirley, chairman, Florence Scott, secretary, Natt Sullivan, treasurer; finance, Max Mathews; exhibit and display, C. O. Schmidt; entertainment, Robert Cooke, George Linville; hotel, Gordon Sveinson, Paul Schwartz; publicity, Richard Heath; reception, Harry Davin; program, Carl Fehr.

The next Northwestern Section meeting will be held in Seattle, Aug. 24-26, 1959.

Southwestern Section—Anaheim

Three code workshops were again the predominant feature of the Southwestern Section annual meeting, the third year in which these have been held. At separate residential, commercial and industrial well-attended meetings all problems of interpretation of the National Electrical Code pertaining to those types of work were discussed. Proposed changes were likewise reviewed and then action taken either recommending or not, the changes being forwarded to the code-making panels. At the final general session all of the recommendations were reviewed and action on them taken by the entire section's active members.

This procedure, initiated by Section President Barney Alverson, San Bernardino County chief inspector, three years ago, is popular because it gives the inspectors a more intimate group in which to express their views and participate in the discussion.

This year a handicap was pretty well overcome by this means. In previous revisions of the national code reprints of the proposed changes have been sent out to all the members. This year the expense was too great and, although copies were available from NFPA at $1.75 per copy, few had ordered them. The large representation of inspectors (172 men registered, 42 of their wives) attended the sessions in which they had particular interest to discuss separate articles or chapters of the code.

The residential workshop in general approved the proposed changes in the national code relating to an increase in appliance circuits, grounding receptacle requirements, the 6-ft rule on receptacles, built-in range circuit requirements and conduit fill and heating committee reports. All workshops asked that the adapter removal tool for type S fuses be taken off the market. All, likewise, endorsed the action of the IAEI circuit breaker interchangeability committee to establish circuit breaker classifications of from zero to 20-, 21- to 50-, 51- to 100-amp groupings on 250-v breakers. Robert Fassbender was chairman and Les Waggoner secretary (both Arizona Public Service Co.) of the residential code workshop.

The industrial code shop voted to have definitions of feeders clarified. Another action was to recommend a code change requiring that, in the raceway entering a switchboard, conduit projections be limited to 1½ in. in order to allow enough wiring space. Marking of transformers to show temperature rating of conductors needed to connect them was also asked. The industrial code shop was under E. V. Muller, California Department of Industrial Safety, chairman, A. W. Pollock, Santa Monica electrical inspector, secretary.

The commercial workshop recommended several studies to Underwriters' Laboratories and especially that a committee at IAEI level be appointed to study the protection of fluorescent ballasts. Commercial code shop was chairmanned by John R. Thompson, Berkeley electrical inspector, R. D. Johansen, Alameda inspector, as secretary. Chester H. Hefner was chairman of the code panel part of the program.

As he had at other meetings, IAEI President Dewey L. Johnson of Atlanta, Ga., discussed the organizational problems of the IAEI and recommended the proposed changes in the articles of association that would bring in more revenue from dues in order to support the association on a more independent basis.

He likewise mentioned that all sections had passed resolutions on circuit breaker interchangeability, all of them different, and that a committee had been attempting to coordinate these. Opposition had been met from the manufacturers but when told that individual cities would pass ordinances all over the country prohibiting their use, a new look has been taken and cooperation is promised on the problem. He likewise talked on the type S fuse situation and explained that the contractors had asked for the enforcement date to be set to Jan. 1, 1961, in order to assure that supplies of the required fuses are stocked. The section, however, voted later to set the date Jan. 1, 1960, rather than '61.

Southwestern Section President Alverson supported Johnson in his plea for approval of the dues increase. He also urged more participation and the seeking of qualified and interested members to serve on the important committees.

President Johnson announced that the New Mexico Chapter had asked to be transferred from the Western Section to the Southwestern Section and that the Western Section had approved. Since no formal request had been received by the Southwestern Section, no action was taken.

Everett Cogan, now the secretary-treasurer, IAEI, spoke briefly of the financial situation and told that, to

Chester Hefner, newly elected, takes over as president from Barney Alverson

reduce the cost of the proceedings and of mailing, copies would be sent to those requesting them by mail.

Frank Stetka, new field engineer for the NFPA, reviewed quickly the major changes proposed in the next edition of the National Electrical Code and told that the industry has until Dec. 1 to make effective any further changes. He called particular attention to the new numbering system but said that the old numbers would be published in parenthesis.

To present the manufacturers' side of the circuit breaker problem, Michael J. St. John of Federal Pacific Electric Co. declared that, despite all the talk there had been no specific case brought to the manufacturers' attention where circuit breakers had been interchanged and up-sized. He pledged the manufacturers' cooperation but told that when a 600-v rating was injected in the matter the manufacturers had balked.

The problem of design is complicated by the fact that there are five manufacturers making such breakers and, while they are interchangeable with each other, to make it impossible to put in a breaker of a higher rating in all of the designs is a considerable problem.

Phillip White, Bakersfield inspector, showed a number of color slides taken at fires claimed to be of electrical origin and discussed the probable causes.

H. D. Reed, specialist in the low-voltage switch gear department, General Electric Co., Philadelphia, discussed and showed a moving picture dealing with "fault currents and protective devices in low voltage power systems." These dealt primarily with equipment to meet the high interrupting capacity requirements necessary on network systems. Four types of equipment were described: (1) fused interrupter switches, (2) molded case breakers, (3) large power circuit breakers at low voltage and (4) combination circuit breakers and fuse equipment. His advice, "Never choose a device that is underrated."

Robert C. Graham, chief engineer, Rome Cable Corp., Rome, N. Y., told the members of a number of new insulating compounds that will be used in covering of wire in a talk entitled "Something New on Wire." He predicted an automatic standardization on RHW 75° wire for wet or dry locations and increased use of new silicon rubber higher temperature wires. He cautioned, however, that with all the talk of higher temperatures a point of no return is reached where conductor losses can not be afforded even if the insulation will withstand the temperature. He visualized in the next five years a single wiring material for use underground or overhead, in conduit or out, that would eliminate much of the alphabet confusion now in the code tables.

A speaker who was to have discussed the California State Division of Housing new trailer coach code did not appear.

In addition to the regular sessions a code breakfast was held in which calculations of load per trailer park service and use of 277-v plugs were questioned. Another session was held before breakfast on Wednesday to show pictures of installations in violation of the California State Safety Orders. This, too, was well attended.

At the election of officers Chester Hefner, inspector, San Mateo County, was elevated to presidency from first vice-presidency and Ernest L. Nelson, San Leandro, to first vice-president; Arthur P. Vesco, San Diego, second vice-president; Charles R. Pierce, Fresno, third vice-president. Secretary-treasurer L. E. La Fehr was re-elected. The executive committee members elected were Barney Alverson, junior past president; for Arizona, Les Waggoner; central California, George Hayden; Hawaii, E. Warren Small; Nevada, I. J. Sandorf; northern California, Del Hanson; Sacramento Valley, Lester Woldit; southern California, E. V. Muller; and associates, H. K. Winterer, William A. Cyr and Herbert Ufer. Representatives on the IAEI executive council elected were E. E. Carlton, A. C. Veit, with Barney Alverson and Frank C. Jones as alternates. L. E. La Fehr is a member ex officio.

The next annual meeting of the section will be held at Santa Rosa Aug. 31-Sept. 2, 1959.

All arrangements were capably handled by General Chairman A. J. Hund, Anaheim inspector, and his committee—Walter F. Reed, Orange county inspector; R. N. Finfrock, Santa Ana inspector; T. P. Regas, Vern Blum, W. G. Vasvary, L. E. La Fehr, C. H. Hefner and Mrs. Finfrock.

The new team lineup—Barney Alverson, Lou La Fehr, Chester Hefner, Frank Jones, E. E. Carlton, H. K. Winterer, Del Hanson, E. V. Muller, Ernest Nelson, Arthur Veit, W. A. Cyr, Arthur Vesco, Les Waggoner. Others elected had already left for home

Here during a tour of B. C. Power Commission's Georgia gas turbine generating plant are from left: James G. Gruetter, BPA; C. W. Nash, B. C. Power Commission, new chairman of the Power Use Section; V. M. Cleaveland, NWPPA president; Don F. Jackson, Central Lincoln PUD, outgoing section chairman; Commissioner H. H. Griffin; Gus Norwood, NWPPA executive secretary

Northwest Public Power Assn.:

"Electricity Is the Spark"

BENEFITS to the community, the economy and the utility of increased electric use were stressed by speakers at the recent Power Use conference of the Northwest Public Power Assn., held at Nanaimo, B. C.

Introducing the theme, "Electricity—Sparking Community Development," Charles W. Nash, director of load development, B. C. Power Commission, called this service "the spark that ignites the economic mixture of men and materials, money and markets" today. He cited Vancouver Island where, since 1945, wages and salaries have more than doubled; annual value of factory shipments have increased more than three times and annual electric production from commission plants alone more than 49 times, to 712,000,000 kwh.

That utilities have a responsibility for their regions' steady, sound economic growth was the contention of Axel E. Strom, Grant County PUD, who believes that a valuable contribution can be made even with a very modest budget for area development.

Asserting that an adequate supply of electric energy is one of the prerequisites to a full-employment economy, James G. Gruetter, load forecasting officer, Bonneville Power Administration, predicted a four-fold use of electricity for industrial customers by 1975. Nationally in the 18 years between 1957 and 1975, kwh required in nonagricultural employment will have increased one trillion, 900 billion, or 11.7 kwh per man-hour, if we assume continuation of the rate of growth experienced in the period between 1947-1957. (The 1947 figure was 2 kwh and the 1957 3.8 kwh for every hour of employment.)

Each year industry has looked to electric utilities for an increasing proportion of its power supply, Gruetter said, this figure having grown from 76% in 1947 to 82% in 1957 with an expected 90% in 1975. Thus the utility supply will grow even faster than the total labor force electric load—about 4 1/3 times by 1975. Naming some of the industries that will be responsible for this increased use, he pointed out that many will exceed present use predictions and other equally significant industrial loads probably have not yet been developed.

Considering the question: "Can we upgrade our hydro resources through use of sunspots?" Robert B. Gallup, R. W. Beck & Associates, asked if the Critical Water Period were not too severe a test for determining firm power. He believes that there is tremendous potential benefit from further detailed analysis of the use of long-range cycles. With the periodic pattern of seven-year, seven-month stream flow deficiencies so well established, he believes that all utilities should approach any future period deficiencies with open eyes. Likelihood of stream flow deficiencies occurring at those intervals is great, he said, and it should be noted that the current period ends in October 1959.

In a talk that backed up statements with figures, Frank Falge, Western regional manager, Live Better Electrically, warned that, in face of gas competition, the electric industry must move fast if it is not to be left standing in a business hole. While many utilities in the past have discouraged certain electric loads, with the competition it is gas all the way, he said. (As one example of inadequate promotion by the electric industry, he cited dryers, which are proving a "soft touch" for gas. Since 1948 electric dryers have dropped from a 5 to 1 lead to the present 2.3 to 1 margin.) It is vital, he said, to have the value of loads appraised on the basis of the present and future, rather than the past.

Electric heat is a good load and the American public wants it, Lacy M. Peoples, Cowlitz County PUD, brought out in a talk that warned against denying "customer-owners" the service they desire at the lowest possible cost.

S. L. Forsyth of Westinghouse gave his talk on electric heating in the home, previously reported.

Commercial lighting is a desirable load from an engineering standpoint

as well as being a builder of revenue and good will, G. Donald King, Sylvania Electric Products, pointed out in a talk on lamp characteristics and uses, foot-candle recommendations and selling aids. "Do your customer a favor. Recommend his lighting job with an eye to the future," he urged.

Installation of electric ranges as a public service for schools, granges and community clubs was described by Iva Burnstad, Northern Lights. This utility also has provided correct pans, a griddle and large coffee makers at cost to such groups and has aided 4-H Club money raising with light bulbs, also at cost. Its financing plan has put into the community about $450,000 in 1,035 contracts.

Importance of community club activity as a public relations builder was brought out by C. Burnip, B. C. Power Commission, and use of pamphlets to keep customers informed was reported by C. A. Penney, Clark County PUD. Harry Sherman Jr., Forest Grove, Ore., told how a small utility conducted a home show that attracted 2,500 people in four days.

How kwh costs of utility operating expenses can be sharply reduced through increased use was pointed up by R. C. Cornelius, rate engineer, Seattle City Light. He gave figures showing that cost per kwh for distribution plant to serve ranged from 1.23c per kwh for 1,200 kwh to 0.32c per kwh for 9,000 kwh and 0.30c per kwh for 21,000 kwh, including high use plus heat.

Reductions in kwh costs as volume use per customer is developed can be even more pronounced in certain other utility operating expenses, he said. Using an average of $4.80 per year per customer as the cost of meter reading, accounting and collecting, the kwh cost of this expense amounts to 4/10c per kwh when 1,200 kwh per year are used but drops to about 2/100c per kwh with maximum use. Kwh costs of transmission, hydro generation and other operating expenses also are sharply reduced, he said.

The "U" factor, or degree to which each utility's investment is utilized, is the key to prosperity, according to David A. Pease, research editor, NWPPA. For an electric utility to achieve a good U factor, it must have load to make full use of system capabilities and here he believes there are some very serious blind spots. As an example, he said a utility may be willing to spend $6 on a line extension to get $1 of annual gross revenue and unwilling to spend $1 on sales promotion to bring its return to $2 on a $7 investment.

Changing the guard—Ed Meise, first president, installs new president, Bill Marsden. A. R. Combs, left, Sam Hall, retiring president, and Congressman Wilson below

San Diego Readies

FROM its congressman, a U.S. Department of Commerce assistant secretary and a panel of five appliance manufacturers, dealers and distributors in the San Diego area received strong assurance of continuing prosperity at the annual fall conference of the Bureau of Home Appliances of San Diego County Sept. 25 in Balboa Park. As has become habitual, about 500 crowded the House of Hospitality for a compact after-dinner conference, every item of which clicked off on time.

President Sam Hall, Electric Supplies Distributing Co., noted an increase in the past year of 50 new members, a great acceptance of the group medical plan and a particular feature of 140 visits to dealer members in a 20-day period by himself and Secretary-manager J. Clark Chamberlain. Installed to succeed him by the first president, Ed Meise, was Bill Marsden as the new president.

Candid feature of the program was the questioning of the panel of five appliance manufacturers, none of whom previously were acquainted with the questions, by Harry E. Callaway, owner of Thearles Music Co. and a past president. He put pointed questions at each of the panel consisting of Gordon Boyle, vice-president of sales, O'Keefe & Merritt; Russ Crotwell, Pacific division manager, Lennox Industries; Ken Johnson, vice-president for sales, Packard-Bell Electronics; Howard Scoglund, Western regional manager, St. Charles Kitchens; and S. H. Zoellner, regional manager, Frigidaire Sales Corp. All predicted increased productivity, additional employment and excellent marketing prospects in the year ahead. A summary of some of the panelists' observations follows:

Johnson—Color television must be improved, made cheaper and carry more programs to get off the ground. Stereo equipment soon will be big enough to rival television—one prediction is annual sales of $750,000,000 in five years compared with present TV sales of $840,000,000. Tapes in magazines soon will approach cost of phonograph records and because of their convenience challenge discs.

Zoellner—Frigidaire will produce a combination washer-dryer but company officials cannot predict if this appliance will overtake individual washer and dryer units in sales. Adjustment of production by manufacturers to meet sales has stabilized the appliance industry and prevented chaos this year. However, inventories are low now. This may be all right because new lines are being introduced. The biggest problem in the appliance industry is to protect proper margins for dealers so that they

On-the-spot panelists: Crotwell, Zoellner, Johnson, Moderator Callaway, Scogland and Boyle, who met questions head-on

for A Boom

can provide necessary services for consumers.

Boyle—Manufacturers of gas ranges lost ground to electric ranges up to last year or so. Now they are overcoming weaknesses caused by too many manufacturers and are coordinating and pooling resources in advertising and promotion.

Scoglund—The potential of the "kitchen" is unlimited, but dealers are needed. The market is divided between old and new homes. There is no place in this business for the "average" appliance dealer.

Crotwell—The heat pump will rival and soon equal sales of conventional heating equipment on the West Coast. The climate is ideal for this appliance. Utilities are particularly cooperative in promoting the heat pump and air conditioning units.

A former department store executive, Carl F. Oechsle, Assistant Secretary of Commerce, talked the language of the dealers present. Better jobs and job opportunities depend upon selling and sales promotion, he declared, and he praised the President for not being stampeded into a spending policy that would "saddle future citizens with the fiscal sins of their fathers by such a joy ride down the primrose path to future inflation and ultimate bankruptcy."

The slump has caused businessmen to reappraise methods, costs and prices, he said, and made them decide "to make what will sell, not sell what they make." With the enlarging baby crop creating the best market in the world, he suggested many promotional ideas, particularly free home trials and the renting of appliances with payments applied toward ultimate purchase. This, he said, might be effective in promoting color television. "Never sell America short," he concluded.

That the career of retailing should never be sold short either was the strong plea made by George A. Scott of Walker Scott Co., who told of a program for development of "Careers in Retailing." As a highly skilled and technical business, he said that it should be regarded as such and the development of the skills enhanced by a real training program.

San Diego's Congressman Bob Wilson closed the snappy meeting by telling of the growth of the area, the need to provide jobs and services for 4,000 newcomers monthly and by telling of the heavy defense and military spending that will be done in the San Diego area, offering a favorable and rosy economic outlook.

Calendar of Meetings—1958, 1959

NOVEMBER 1958

17-20—*National Association of Railroad and Utilities Commissioners*, annual convention, Hotel Westward Ho, Phoenix.

19-20—*Pacific Coast Electrical Assn.*, Administrative Services Section, Hotel Claremont, Berkeley.

29-Dec. 3—*Bureau of Home Appliances of San Diego County*, 25th anniversary Electrical Appliance Show, Balboa Park, San Diego.

FEBRUARY 1959

8-14—*National Electrical Week.*

12-13—*Pacific Coast Electrical Assn.*, Business Development Section conference, Hotel Sheraton-Palace, San Francisco.

14—*Snake River Valley Electrical* Assn., annual conference, Boise.

—*Intermountain Electrical Assn.*, annual conference, Ogden.

MARCH 1959

30-31—*PCEA*, Engineering & Operating Section conference, Hotel Lafayette, Long Beach.

APRIL 1959

—*Rocky Mountain Electrical League*, spring conference, Denver.

—*International Association of Electrical Inspectors*, annual meeting of Idaho, Utah, Montana and Nevada Chapters. (Not set as yet)

—*Bureau of Home Appliances of San Diego County*, spring conference, also Spring Fair, Balboa Park, San Diego.

8- 9—*PCEA*, Administrative Services Section conference, Hotel Lafayette, Long Beach.

22-24—*Northwest Electric Light & Power Assn.*, Engineering & Operating Section, Purchasing Committee, Hotel Utah, Salt Lake City.

MAY 1959

6- 8—*Institute of Radio Engineers*, regional conference and trade show, University of New Mexico, Albuquerque.

11-12—*Illuminating Engineering Society*, Intermountain region conference, Hotel Continental, Denver.

Guest speakers at Profit Clinic—NARDA President Joseph Fleischaker (center) with Dick Finch, Medford, Ore., dealer, left, and Mort Farr, NARDA board chairman

Profits are the subject as

Dealers Meet in Seattle

NATA officials—Above, President Bert Pierce (center) with Ward Davison, past president (left), and Liberino Tufarolo, program chairman. Below, from left, Merle Lamphere, Wenatchee, Wash., dealer, Tom Carmichael and Fred Egge, ex officio board member

PROFITS should be made on present volume; price alone won't make a business; low margins are unproductive in the long run; "dogs" should be junked even at a loss; a retailer's troubles may be his own fault. These are some of the points brought out by speakers at the sixth annual Profit Clinic sponsored in Seattle by the Northwest Appliance & Television Assn. Stereo and hi-fi were on everybody's mind with dealers enthusiastic over a promising future in these lines. Here are just a few of the remarks made by a well-informed group of speakers.

This country has not been having a recession but an economic coffee break that has taken some of the fat out of the appliance business and left remaining dealers better prepared for a tomorrow that will see business doubled within 15 years, said Mort Farr, Upper Darby, Pa., dealer and past president of NARDA. Earnings made right after the war won't return, he believes, but there will be better opportunities. Now is a good time to get ready, to find the credit and hire salesmen.

Retailers have not shown enough independence, have allowed distributors to do their thinking, advertising, servicing, Dick Finch, Medford dealer, declared. Sears Roebuck, he said, has proved that a virile retailer knows more about retailing than a manufacturer or distributor.

Reminding that the distributor has a threefold responsibility, James Phillips, J. W. Phillips Distributing Co., Seattle, said that distributor margins have sunk too. There is a happy balance between gross profit and turnover, volume is not 100% the answer, he declared.

"Fix 'em and sell 'em," advised Gordon Kyllingstad, Sunnyside, Wash., dealer. His suggestions: do not hire extra help for repairs but let stock accumulate for a slack time; go through it periodically; ax unsalable merchandise.

As a formula for selling stereo and hi-fi, Edward A. Altshuler, management consultant, Los Angeles, suggested: (1) research the market; (2) plan your program and work your plan; (3) get all the training you can; (4) have enough capital and use it wisely.

Sell value rather than price; improve profit by selling more goods at higher prices than before; use the last half of 1958 to make a profit and encourage manufacturers to continue to provide the kind of sets that can be sold honestly for more money was the advice given by Robert Shaw, general manager, Sylvania Home Electronics.

Range Drive Starts New Plan

Floyd Lovelace explained, Bob Cockfield drove home the new range sales program

WITH a wire-on-time payment plan, a $30 cash allowance for wiring a free-standing range, an extra commission to salesmen making range sales and a contest awarding six ranges as prizes, the Los Angeles Department of Water & Power enlisted the appliance distributors, dealers and electrical contractors of Los Angeles for the beginning of a new selling program at a kick-off dinner Sept. 18.

But the most significant aspect of the new program is that this municipal utility has undergone a change in viewpoint. Bound by a charter requirement that each 10 years an independent engineering firm review its operations, the commercial or "business agent's" division has been blocked in most of its effort to develop electrical business because it was presumably a monopoly and did not need to. Under such thinking the sales promotion and advertising budgets were cut to the bone, staff and service were limited.

Despite very low rates the public did not snap to accept the electric range and other appliances and the gas companies took over one of the nation's greatest potential markets.

Under its most recent engineering review, made by Ebasco, a new concept has been given. The business agent's division has become a commercial department, staff has increased, a budget has been set up and a program of appliance and other promotions set in motion. With the hobbles taken off, the personnel has sprung to life and is eager to capture more of the range business for electricity. Likewise, campaigns to follow on dryers, water heaters, air conditioners, etc., are promised.

First evidence of the new lease on life was the kick-off dinner Sept. 18 presided over by Gerry S. Allen, manager of retailer coordination, and with W. F. Lovelace, residential sales manager, and R. H. Cockfield, general sales manager, describing the new program and giving the industry a shot in the arm.

Lovelace described four points of the beginning program. It consists of a plan by which owners or tenants of the home may have their wiring financed by the department and pay for it with their monthly electric bills. For the range campaign, a $30 cash allowance is given the customer to help pay for the wiring provided it is a free-standing range. An extra commission to the salesman is provided for each wiring-range sale made during the campaign from Oct. 1 to Nov. 30. Coincidentally, and to draw customers to the dealers' stores, six electric ranges are being awarded by manufacturers as prizes for an essay contest. An employee conversion campaign will also be staged to get more of the department's own employees using electric appliances. The wiring time payment plan will apply to wiring for dryers, water heaters and air conditioners as well.

To back up the campaign is a strong program of advertising over radio and television, newspaper ads, billboards, car and bus cards and vehicle cards with point-of-sale material for dealers. The Los Angeles Electrical League is cooperating fully in the program and helping to get dealer participation in it, Glenn Logan, its manager, declared.

Telling of the promotion campaign were Elwood Robinson, advertising agency executive, and Samuel L. Friedman, public relations director of the department.

Both Cockfield and Lovelace emphasized the part that electrical contractors would play in the program. They urged dealers to make arrangements separately with electrical contractors for wiring arrangements and, if possible, to work out flat wiring plans for typical house installations. Cockfield spoke candidly, saying that there was no use dreaming over any free wiring. It was better to face the facts and to make an arrangement to sell the wiring. He said the department would like to see the banks finance it but no bank has objected to this plan. With it contractors and dealers will have something to sell and can do so, especially with extra incentive to the salesmen.

Pictured by a skit with Ed Baker, Sam Farmer and "customer" Thirza Schank

New Home for Utility

REPLACING more than a dozen scattered shops and warehouses plus an outgrown downtown office building, Washington Water Power Co.'s new $7,500,000 service center consolidates office, operating and service facilities. The 28-acre site along the Spokane River on the city's north side is in the geographic center of the metropolitan area.

An addition to the city, with its attractive modern buildings and beautiful landscaping, the center is receiving a good deal of favorable comment. More than 10,000 attended the opening and visitors are still asking to inspect the buildings.

The facility was built in two stages. A service building was occupied in 1956, while the five-story office building with connecting auditorium-cafeteria was completed last August.

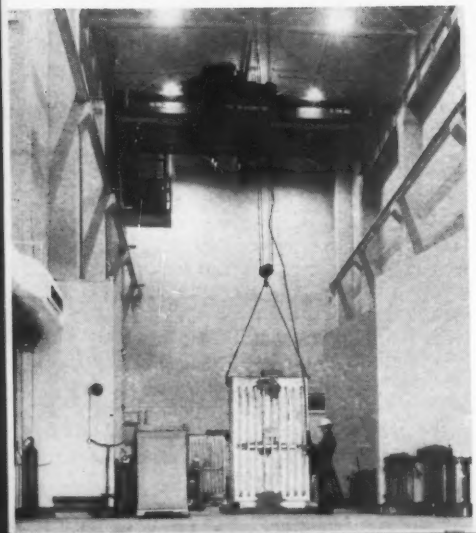
A completely efficient utility service center, the facility was designed with the public as well as some 700 employees in mind. For instance, the 300-seat auditorium will be available for public meetings and therefore was planned for easy operation of lighting controls and stage facilities. It has theater-type seats, projection booth, stage and sound facilities, with particular attention to acoustic design.

Adjoining the auditorium is a lounge area, with telephone service, and a cafeteria that accommodates 296 employees at one time. Meals are prepared in an all-electric kitchen.

A feature of this wing is an "all weather" covered terrace for outdoor dining. This patio area is radiantly heated, with panels of Lamitherm, a chemically impregnated paper, in the ceiling and electric cables in the floor. The installation was designed as a means of determining the combination of ceiling and floor heat that is most comfortable and results will be used as a basis for recommendations to customers desiring outdoor heating.

More than 120 offices and meeting rooms are included in the 114,000-sq-ft office building. Exterior walls combine brick veneer with colorful aluminum and glass curtain walls set with insulated windows. Interior walls are movable metal partitions in modular panels. The building is fully light conditioned, with more than 10,000 individual lamps providing levels ranging from 30 to 170 foot-candles.

In addition to offices and meeting rooms, the center has complete photographic and darkroom facilities, a well-equipped preparation kitchen, a medical center and telephone exchange.



Top: The pool with its fountain and smaller fountains around the building are a delightful feature and also serve as exhaust for the heat pump. No water is wasted since it is used for irrigation and any excess goes back into the river. A glass-walled walkway from this office building leads into the auditorium-cafeteria-lounge area. The building is light conditioned inside and out. Center: The 60-ft system operations board has unusual design features. Sound is caught in a surrounding glass wool blanket; pins are used only to indicate abnormalities so that an operator coming on duty can quickly spot unusual situations. Left: In the service building at the rear two cranes, one with a 40-ton capacity, enable the company to handle heavy equipment. Substation and switching equipment are maintained and repaired at this shop

NEW

JOINS 26% FASTER

Because there are no separate couplings to assemble on the job, Orangeburg's new CA Conduit lays faster—costs less to install. In addition, there are no coupling cartons to handle, transport or store.

Orangeburg's new CA Conduit comes, at *no extra cost*, with a factory-attached coupling at one end and a standard 2° male taper at the other end. To join—CA's long, lightweight lengths are placed end to end—hammered home in a simple, one-step operation. Actual installations *prove* Orangeburg's new CA Conduit joins up to 26% faster!

What's more, because the attached coupling is *flush* with the outside diameter of the conduit, new CA Conduit is easy to handle and store in neat, even stacks. And with the new flush coupling there's no need to "stagger" conduit joints in the trench. That means less cutting and tooling time.

New CA Conduit—like the millions of feet of Orangeburg Fibre Conduit in use since 1893—has self-sealing joints and impermeable walls that make it absolutely watertight. Its smooth 100% fibre raceway adds years to cable life.

Specify new CA Conduit on your next job. This addition to Orangeburg's line is available in 2", 3", 4", 4½" and 5" sizes. Orangeburg's Standard and Nocrete Conduit with separate sleeve couplings are available as always. Orangeburg Manufacturing Co., Inc., Orangeburg, N. Y. and Newark, Calif.

Orangeburg Fibre Conduit is distributed by Graybar Electric Co. and General Electric Supply Co. with branches and stocks in principal cities.

Yesterday it was only a dream . . .

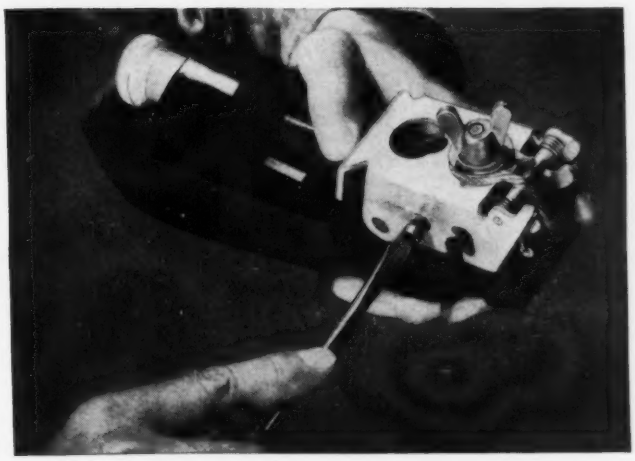
Today Westinghouse brings you an *all-purpose* cutout (**Type EU**) — *one* box and door to handle *all* your enclosed fuse cutout applications! No need to sleep in the warehouse, trying to keep up with the stocking needs for your system with four different boxes and twelve doors to match!

Think of the savings! Just one style box and door for all voltages — 2.6, 5.2, 7.8 kv — all currents up to 100 amperes continuous — with maximum interrupting capacities up to 14,000 amperes. The same cutout for dropout or non-dropout operation. It means simplified purchasing, smaller repair stocks . . . far easier maintenance.

No wild-eyed dream, this! We *know* Westinghouse universal cutouts will interrupt rated faults . . . over and over again. Beginning with carefully developed theoretical designs, we thoroughly proved their performance in grueling "controlled-fault" interruption tests at the Westinghouse High Power Lab. This is your assurance of full value for your protection investment.

A real value it is, too! Call your Westinghouse Sales Engineer today for complete details about this fabulous new cutout and its equally fabulous price. Or, write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. J-60966

TO REPLACE ALL OF THESE ?



Dropout or non-dropout with a twist of the wrist

By simply removing one screw, the new Westinghouse **EU** universal cutout can be converted from non-dropout to drop-out operation. The Moldarta* door is designed for easy manual closing or hook stick insertions.

*Trade-Mark

YOU CAN BE SURE...IF IT'S

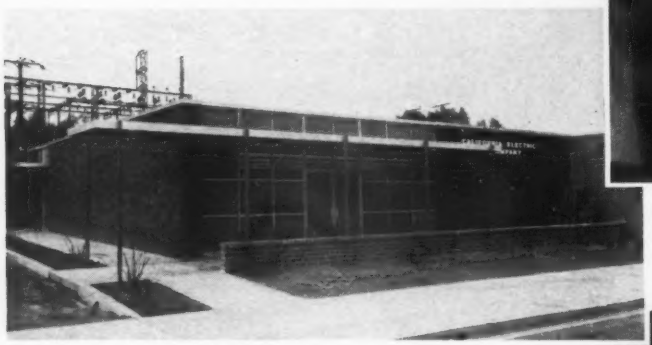
Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

news

Discussing the result of hydraulic studies of the proposed plan for diverting the Skagit River for the second stage construction of the Gorge High Dam of Seattle City Light are: Paul J. Raver, City Light superintendent; C. Ray Hoidal, chief civil engineer; Prof. Harry C. Chenoweth of the University of Washington School of Engineering; Herbert V. Strandberg, chief engineer of City Light, and Prof. Eugene P. Richey, who directed the studies. (See Growth)

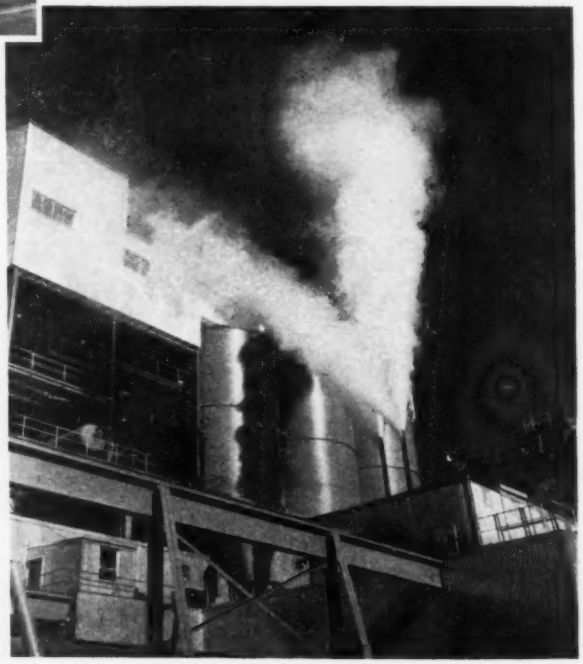
Saving the life of a fellow employee after he received an electrical shock won EEI awards for Duaine T. Walch, left, and Howard G. Anderson, right, of Washington Water Power Co. The awards are being presented by Kinsey M. Robinson, president of WWP



This is the new Perris district office of California Electric Power Co. It was designed by the company's architectural engineering department. (See Management)

With an awesome shriek that spread over Wyoming plains like no sound the lonesome cowboys ever heard before, the blowdown of PP&L's Dave Johnston steam plant's boiler was accomplished. Test was run with safety valves set to "blow" at 600 psi

General Electric Co. donated its one-millionth room air conditioner to the Los Angeles Shriners Crippled Children's hospital. Nurse is Honora Carson. Dan Farmer presents unit



Management

$2½ Billion Commitment

Chief executives of the power companies in the five Intermountain states (Utah, Wyoming, Colorado, Arizona and New Mexico) met last month in Salt Lake City in a long-range planning session. The outcome was a commitment of $2½ billion in new electric power facilities for the area between 1959 and 1975. E. M. Naughton, president of Utah Power & Light Co., stated that the expansion will be the largest in the area's history and will utilize the Rocky Mountains' great reserves of coal, oil, natural gas and uranium.

The program contemplates the installation of approximately 7,000,000 kw of generating capacity, three times the region's present capability.

Utah Power & Light expects to add 1,500,000 kw of new capacity in the period, including a 150,000-kw steam-electric plant at Kemmerer, Wyo., and another thermal station of at least 500,000 kw capacity in Salt Lake City. In the immediate future nearly 200 miles of high-voltage transmission lines will be under construction.

J. E. Loiseau stated that the Public Service Co. of Colorado expects to increase its generating capacity from 726,000 kw to 2,414,000 kw during that period. He also predicted possible integration of the electric systems of the five companies.

The program is in addition to the 1,000,000 kw of capacity that will be brought in when the federal government completes the Glen Canyon and Flaming Gorge projects. Power available from these projects for the investor-owned companies will represent less than 10% of their 1975 requirements and can be readily absorbed in their integrated systems.

► Utah Power & Light Co. has contracted to buy on a nonfirm basis up to 27,000,000 kwh of energy from the Weber Basin project in northern Utah. The rate is three mills in summer and 4½ mills in winter, and the utility will pay the reclamation project about $90,000 annually.

Discussing plans for expansion are, standing, from left, E. M. Naughton, Utah Power & Light; Walter Lucking, Arizona Public Service; M. C. Heffelman, Public Service Co. of New Mexico; and seated, V. N. Hoover, Pacific Power & Light, and J. E. Loiseau, Public Service Co. of Colorado

Tax Treatment Discussed

Robert H. Gerdes, executive vice-president of Pacific Gas and Electric Co., clarified his company's attitude on the policy of accelerated depreciation. Spokesmen for PG and E have appeared before the California Public Utilities Commission and urged adoption of such a policy as a means of giving customers the best possible service at the lowest possible cost.

The company's position, with respect to the tax treatment of accelerated depreciation, urges that tax depreciation be distributed equally over a number of years, essentially the straight-line method of calculating depreciation costs. In this way all customers, present and future, are treated alike. Second, by following this "normalization" procedure, the total long-run costs of rendering service are reduced because the company is able to make temporary use of the accumulated deferred taxes to finance new facilities and thus save some of the cost of money. This, in turn, helps keep rates down.

There is no ultimate tax saving involved in accelerated depreciation because taxes are merely deferred and must be paid later. However, in the early life of new capital equipment, larger depreciation deductions are permitted. From the PG and E standpoint the use of the straight-line method of computing the taxes would enable the establishment of a "deferred tax reserve." Into this fund would be credited the difference between taxes computed under straight-line depreciation and the taxes deferred by accelerated depreciation charges. The funds thus accumulated could be reinvested in the company's capital expansion program, which would reduce the amount of money the company

NEWS INDEX

Association Affairs	116
Growth	92
Management	91
Manufacturers—Distributors	106
Market Development	96
People	111

would have to seek in the money market and pay interest or dividends on. At the same time, the company would pay a fair rate of interest for the use of the money which would be reflected in the over-all operating costs and thus give customers the benefit of "borrowed" funds.

Many utilities have been loath to use the benefits of accelerated depreciation which was authorized by Congress in 1954.

Co-op Sells Out

Shareholding customers of Verde Electric Co-operative in northern Arizona have voted 231 to 80 to sell the utility to Arizona Public Service Co. The price is $600,000.

The co-op serves about 400 customers at Cottonwood, Sedona and communities in the middle Verde Valley south of Flagstaff.

Arizona Public Service has agreed to spend $50,000 in improvements the first year to bring the system up to standard.

"Fax" for Friends

The Arizona Public Service Co. has issued a fingertip fact booklet that will help its employees, stockholders and friends answer questions both about the company and its relationship to the growth of the state. The wallet-size booklet shows how the company's operations directly affect the economy of the state as well as giving detailed figures on the cost of operating appliances and other interesting and useful information. For example, in normal every-day operations, the utility pumps nearly $1,000,000 a week into circulation. Other interesting figures include a plant investment per employee of $73,000 and a plant investment per electric customer of $952. According to Arizona Public Service Co.'s president, Walter T. Lucking, the booklet should be particularly valuable to public relations people by giving them instant access to facts and figures commonly needed in explaining the position of the investor-owned utility.

► John H. Schuler, vice-president in charge of operations at Anderson Electric Corp., will assume the additional duties of assistant general manager, it was announced by Thomas H. Fox, president and general manager.

► Appointment of Lester R. Crane as sales manager of Penn-Union Electric Corp. has been announced by President C. G. Gerlach.

"Partnership" Gains Favor

Two new public opinion surveys conducted for the Puget Sound Power & Light Co. showed that the partnership concept of power production in the Northwest has gained in favor by a ratio of seven-to-one margin. This compares to an endorsement of five to one only a year ago. By a margin of two to one they endorsed the use of local agencies rather than the federal government to provide power capacity and they turned down federal control of all electric utilities by a five-to-one margin. On the other hand, by a three-to-one count they also rejected the idea of the all-private power supply concept.

The surveys also revealed that electric power has diminished as a subject for public controversy. The two most important factors that primarily worry people today are (1) the cost of living and (2) jobs and unemployment. In connection with the former worry, nine out of every 10 people stated that electricity was "one of the best buys for the money" today.

Cooperation

Two of the top three contenders seeking to tap huge natural gas reserves in western Canada have joined forces, at least to the extent of agreeing to build jointly a pipeline through British Columbia. West Coast Transmission Co., the Canadian arm of El Paso Natural Gas Co., and Alberta & Southern Gas Co., Canadian representative of Pacific Gas and Electric Co., will build and use jointly a single large-diameter line. The companies will buy gas independently. The Canadian line will be owned by Alberta Natural Gas Co., equal parts of which are owned by the two competitors.

Promotions

Jack H. Steede and John J. Carson have been named two new vice-presidents of the British Columbia Electric Co. Steede, who has been chief engineer of the electrical division, will take over all of the company's electrical operations on the mainland from Vice-president Tom Ingledow who will direct the B. C. Engineering Co. Ltd., a subsidiary of B. C. Electric.

Carson, director of the company's industrial relations, will now direct all company industrial relations.

William C. Mainwaring is retiring as vice-president of the company after more than 25 years of service, during which time he rose from meter reader to vice-president and assistant to President A. E. Grauer.

► Utilities in the State of Washington have opened a campaign to permit the use of public funds to relocate facilities that must be moved as a result of the state's stepped-up highway improvement program. While the state has agreed to pay relocation costs for municipally owned utilities in Seattle and Tacoma, the existing state law does not permit compensation for private utilities. The next legislature will be asked to amend the law to allow them the same relief afforded the municipally owned organizations.

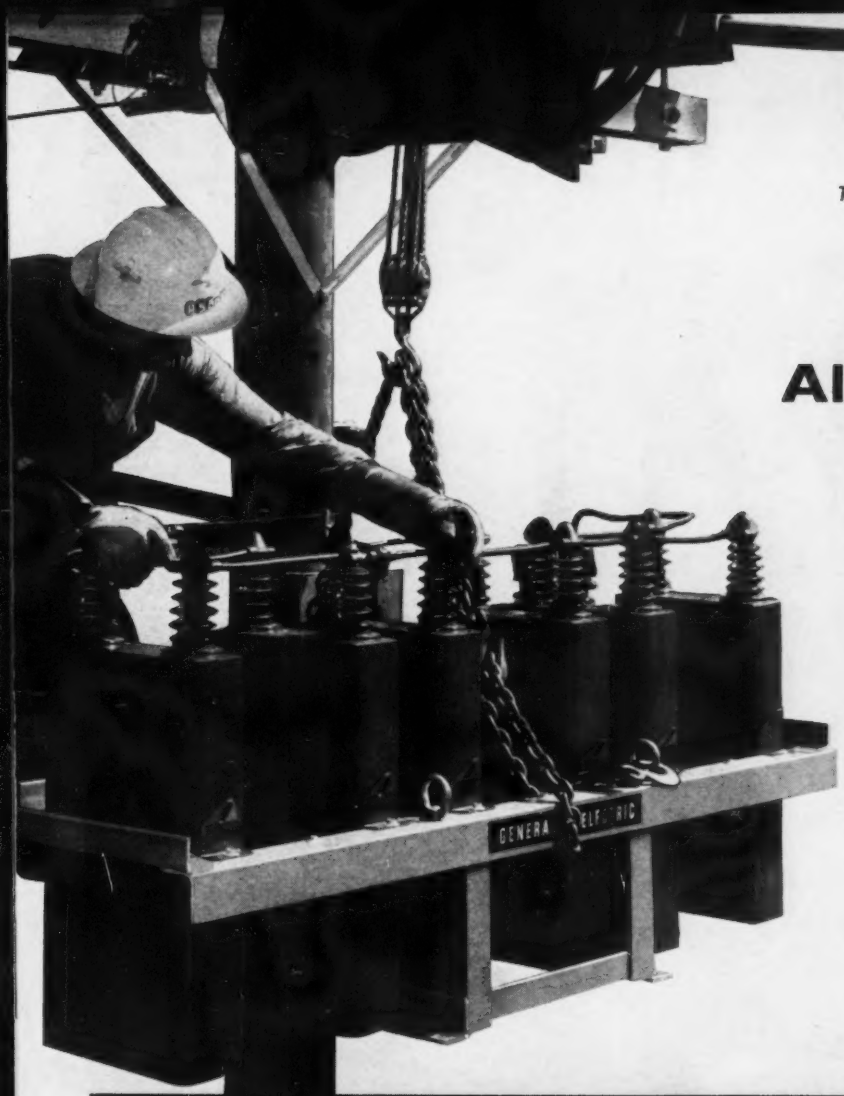
Growth

► Seattle City Light has recommended the additional appropriation of $6,500,000 of City Light funds for construction of the Gorge High Dam. This is in addition to the 1954 appropriation of $23,000,000 for Skagit including the Gorge Dam, installation of the fourth generating unit at Ross power house and construction of the Newhalem-Diablo highway.

► Chugach Electric Assn. will be accepting bids in November for two 10,500-hp Francis turbines and two 8,000-kw generators.

► Two Northwest companies, Pacific Power & Light and Portland General Electric, are beginning the filling of lakes associated with hydro projects. The PGE development is the North Fork project on the Clackamas River. By closing the diversion at Swift Dam, PP&L began creating a 12-mile reservoir behind its 512-ft Swift Dam on the Lewis River. It is expected that water will reach the operating level in December.

► The Los Angeles Department of Water & Power has signed a contract with Southern California Edison Co. to lease 100,000 kw of electric generating capacity from the latter utility for a period of one year beginning Oct. 1, 1961. The arrangement will permit the department to defer large investments at the Haynes steam plant. Price: $2.14 per kilowatt-month or a total of $2,568,000 for the year. In addition, the department will pay 3.45 mills per kwh for electric energy provided through the leased capacity.



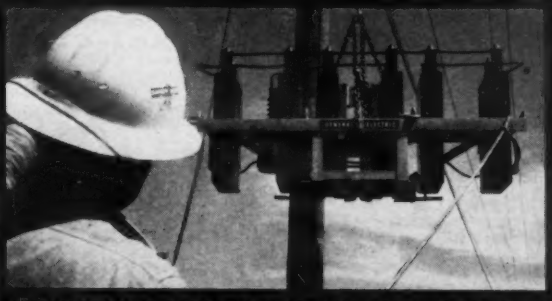
ANOTHER GENERAL ELECTRIC

KILOVAR PLUS

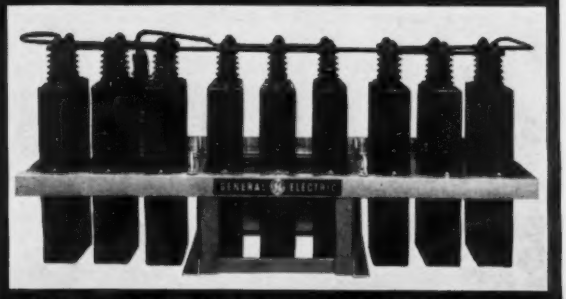
TO HELP YOU CUT INSTALLATION AND MAINTENANCE COSTS . . .

New Aluminum-rack Pole-top Capacitors

- **Lightweight and factory-assembled for easy installation, less strain on pole**
- **Corrosion-resistant to require less maintenance**
- **Braced to front-of-pole for maximum free climbing space**



INSTALLATION IS EASY with lightweight, structural aluminum racks and front-of-pole brackets and mounting arrangement.



NO PAINT MAINTENANCE is needed with G-E pole-top aluminum racks and stainless steel capacitor cases, helping to cut costs.

15–20% less weight of G-E factory-assembled pole-top capacitor equipments in aluminum racks makes installation fast, easy and inexpensive, and reduces bending moment on the pole.

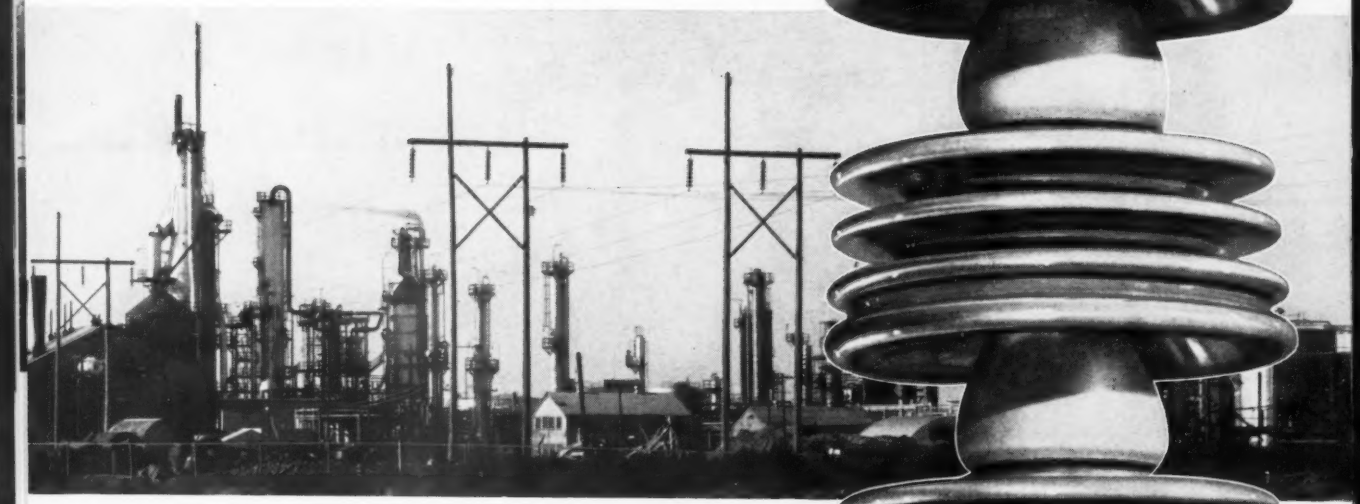
Maintenance costs are low, too. Rugged, jig-welded aluminum structure will not require protective painting, even if drilled in the field. And, G.E.'s stainless steel capacitor case requires no protective paint maintenance.

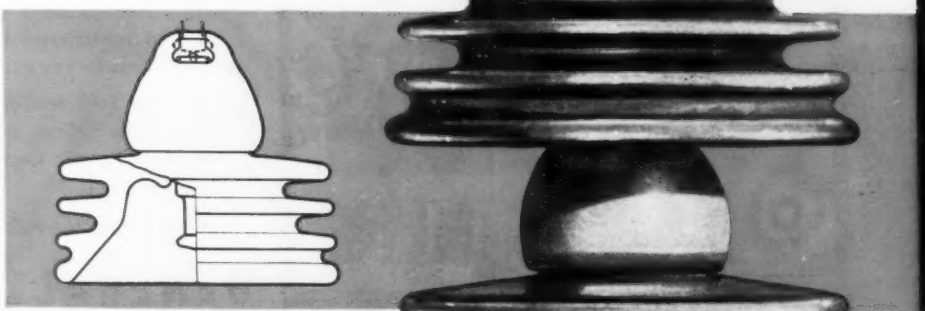
Front-of-pole mounting and bracing affords ample free climbing space, provides greater safety, and contributes to ease of installation and connection to system.

For more information contact your G-E Apparatus Sales Office, or write to Section 445-21, General Electric Company, Schenectady, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC





Standard-strength (15,000-lb.) Lapp Fog-Type suspension unit for 5¾" or 6½" spacing either ball-socket or clevis type

High-strength (25,000-lb.) Lapp Fog-Type suspension unit for 5¾" or 6½" spacing either ball-socket or clevis type

Contaminated atmosphere?

USE LAPP FOG-TYPES

THE DESIGN WITH 33 YEARS OF SUCCESSFUL SERVICE

Industrial fumes, salt-spray, dust, even automotive exhaust, continually coat your transmission lines with a conductive deposit. Where these conditions are excessive, prevention of insulator flashover becomes a prime operating and maintenance problem.

Lapp Fog-Type insulators offer a complete answer. Their design (a Lapp innovation more than 30 years ago) provides extra length of leakage path—and a *uniform* leakage path. Maximum exposure to contamination . . . to wetting . . . to cleaning action of wind and rain—distributes voltage evenly, prevents leakage flashover. Even in most areas of severe atmospheric contamination, Lapp Fog-Types require no cleaning—where they do, cleaning intervals are longer, and cleaning easier than on other types.

Forward utility thinking now calls for use of Fog-Type insulation on *all* lines in sea-shore or urban locations; it pays off in improved service records and lowered maintenance costs. And the specification of Lapp Fog-Type Suspension Units adds an extra margin of operating security and trouble-free long life.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

WESTERN REPRESENTATIVES:

Los Angeles: Earl S. Condon Co. Seattle: Charles F. James
San Francisco: C. E. Ingalls & Sons Butte: R. E. McDonough Co.
Salt Lake City: Riter Engineering Co.

Market Development

EEI Program Aimed at Home Use

A national promotional program to increase home use of electricity has been approved by the directors of the Edison Electric Institute. According to J. E. Corette, president of Montana Power and of EEI, the new Electric Living Program, scheduled to start next February during Electrical Week, will be financed on a voluntary basis by member companies.

The program is designed as a rallying point for manufacturers and other trade allies to coordinate selling efforts in the residential market. It will promote all-electric living, including the Medallion Home.

It Takes Two

"Takes the two to do," is the theme of advertising being run by Inland Empire Electrical League in its current "Perfect Pair" electric washer and dryer campaign. Combinations also are being promoted as a secondary feature in the Oct. 1 - Nov. 20 drive to merchandise the automatic washer and dryer as a single-sale unit.

It is pointed out that a good potential market exists since about 48% of all families in the league area are not using automatic washers and about 64% are not drying electrically.

Distributor Course Popular

Large enrollment has forced the NAED class in Electrical Supply Utilization to move from a regular classroom to an auditorium at Los Angeles Trade Technical Junior College.

Previously limited to 50 students, the course was expanded to permit enrollment of 105 this term and this quota was quickly filled. There is even a waiting list.

The class, which meets every Thursday from 7 to 9 p. m., is conducted by Bernie Mason of Westinghouse, who is assisted by leading manufacturing personnel in the Los Angeles area.

The course runs for 37 sessions during the regular school year, and students are permitted to enroll at any time. They may receive a certificate of enrollment one year from the time they start the course.

Although the class is primarily designed for electrical trainees, others such as industrial buyers, manufacturing personnel and contractors are reported finding the course valuable.

LBE Trousseau

Utility home service departments are cooperating in the Favorite Recipe Contest sponsored by Seventeen Magazine for teenage girls. The yearly competition offers for the best individual recipe a 15-piece Live Better Electrically housewares trousseau and an all-expense trip to New York for the winner and her mother. In addition a school division contest for collections of recipes is conducted by Seventeen-at-School in which the winning class or club is awarded the housewares trousseau.

Among utilities participating is Hawaiian Electric Co., where Erma Meeks Boyen, home service director, has announced that her staff is working with home economics teachers, 4-H club leaders and individual teenagers on the project.

Trips for Customers

In a three-month campaign, electrical appliance dealers in Honolulu offered round-trip flights to neighbor islands to customers buying at retail one of five electrical appliances. The five were range, water heater, clothes dryer, automatic dishwasher, room air conditioner.

The program was sponsored by the PCEA Electrical Living Committee with participating dealers and distributors. Two-fold purpose was to show improvements engineered into new major appliances and to stimulate travel and foster even closer ties with the islands.

Travel bonds given as soon as the appliance is installed were redeemable at airlines offices before Oct. 31. They cannot be transferred or redeemed in cash but tickets will be good for one year from date of issue.

► **John M. Jorgenson** has joined Mechanical Equipment Supply Co. at Honolulu as sales and promotion manager. He formerly was with the Von Hamm-Young Co. as manager of the refrigeration and air conditioning department. Mechanical Equipment distributes air conditioning systems and plans to add package units to its inventory.

Proving again that extra effort pays off, one of the winners in NEMA's electric fan window contest was an entry from San Diego, where "nature's air conditioning" has generally seemed sufficient. Here Winner Herbert J. Schwartz of Baranov's receives a $50 U. S. Savings Bond from Jim Kopp, local factory representative for General Electric. Looking on are Bob Ennis, G-E Supply Co. sales counselor; J. Clark Chamberlain, secretary-manager, San Diego Bureau of Home Appliances; Bob Rode, district sales manager, G-E Supply. The window's theme was a natural for the San Diego area: "Cool as an ocean breeze with an electric fan"

All-Electric at Seattle

Of 1,771 applications received by Seattle City Light for electric service for single-family houses during the first eight months of 1958, all but nine qualified for the all-electric rate, according to figures released by the utility Sept. 25.

Of 1,593 applications for apartment units, 1,475 specified all-electric. Of the remaining 118 apartment units, 114 had electric ranges but were not eligible for the all-electric rate because they did not have individual hot water tanks.

Premium Promotion

Sales of General Electric automatic washers are being promoted in the Rockies with a premium of "no iron" sheets and pillow cases. R. J. Zabriskie, advertising and sales promotion manager for G-E's Major Appliance and TV Receiver Division at Denver, said the offer will continue until the end of 1958.

Buyers may choose with their washer either a set of sheets and pillow cases for twin beds (retail value $16.72) or for a double bed (retailing at $9.92).

► In the West for the company's Dealer Rally Week, Sept. 29-Oct. 3, was a team of Westinghouse executives headed by **John J. Anderson,**

What this tag on OKOCORD portable cords and cables means to you

This "QC" (Quality Control) tag, the final one of a series, is Standard Operating Procedure for every length of OKOCORD **before** it is shipped out to you. It's your assurance that Okonite's modern equipment, skilled craftsmanship and overall Quality Control program combine to build more **value** into OKOCORD portable cords and cables.

Here are six other steps, typical of all OKOCORD manufacturing operations, where quality is constantly checked and maintained by the Quality Control Lab and every operator and supervisor in the plant.

1. **QC Lab tests copper rod, raw materials against Research-developed standards to maintain uniform, high quality.**
2. **Strands are continuously drawn, annealed and steam cleaned with every run passed for size, strength, flexibility.**
3. **Compounds are mixed, milled, strained and refined in a continuous mechanized sequence to help eliminate error.**
4. **Microscopic examination of compound batches, in addition to physical and electrical tests, checks particle dispersion and authenticates compounding.**
5. **Latest type of continuous lead extruder eliminates damaging press stops in applying continuous mold for vulcanization—guarantee of OKOCORD's "tire-tread" toughness.**
6. **Okonite QC imposes the most rigorous tests in the industry, in process and final.**

Each reel of OKOCORD bears this quality control tag. It's your assurance that the OKOCORD you buy will be a long-term investment. The Okonite Company, Passaic, N. J.

Buy through your distributor.

Write for this newly-published 64-page catalog on OKOCORD. Full information on construction components, cable assemblies, dimensional tables, engineering data plus splicing and terminating drawings and instructions.

where there's electrical power . . . there's **OKONITE CABLE**

6379

at last! Here's the KEY to a safe, economical, attractive underground distribution system

RT&E Terra-Tran

The new, completely self-contained **TERRA-TRAN** for underground distribution reduces transformer installation costs. No separate enclosures or protective equipment required. Full KVA from transformer — no derating. This means lower cost for the complete underground system.

The new, attractive **TERRA-TRAN** is designed for pleasing appearance, painted to harmonize with the suburban landscape. Unobtrusive, easily camouflaged by shrubbery. Poles and wires are eliminated, enhancing the general appearance of the entire area.

The new, extra-safe **TERRA-TRAN** has all live parts enclosed in a locked, tamper-proof compartment. In addition, special interlock on door prevents entry of foreign objects.

The new, versatile **TERRA-TRAN** transformer is admirably adapted to new suburban residential areas, to shopping centers, to schools and institutions, and to industrial parks. Available in single and three-phase applications.

A

Swinging door provides authorized service access to operating compartment for service personnel only. Door has baffle edge to prevent accidental contact with live parts.

B

Externally operated bayonet type disconnect switch designed for hook stick operation.

C

Externally replaceable bayonet type primary fuse designed for hook stick operation.

D

Features the industry-famous RT&E wound core with high mechanical strength, repairability, light weight, low losses, and low exciting currents.

E

Low voltage bushings externally clamped for easy inspection and maintenance.

F

Extended copper bus provides ample space for terminating multiple secondary leads.

G

Extended copper bus for secondary ground connectons.

H

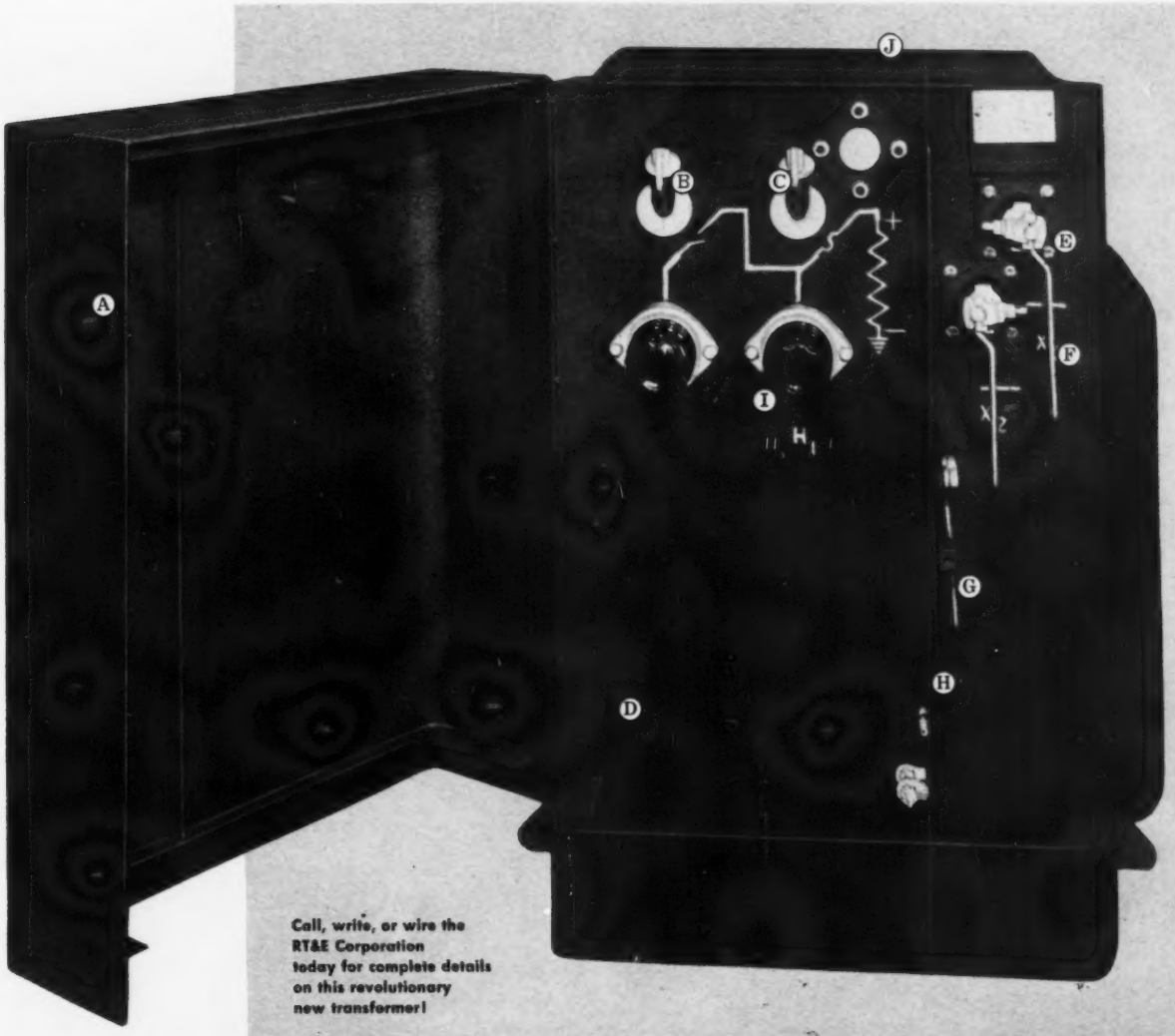
Steel safety divider between high and low voltage sections.

I

Externally-clamped, insulated knob-type high voltage bushings are specially designed for terminating shielded high voltage cable.

J

Tamper-proof cover, arc-welded to heavy gauge steel tank.



Call, write, or wire the RT&E Corporation today for complete details on this revolutionary new transformer!

ENGINEERING TALENT CONCENTRATED ON ONE IDEA — A BETTER TRANSFORMER

RT&E CORPORATION

WAUKESHA, WISCONSIN • PORTLAND, OREGON

manager of the major appliance division, Mansfield, and **Louis G. Berger,** general manager of appliance sales, Pittsburgh. The team called on dealers in 16 major markets in the 11 Western States. The calls were arranged by **M. B. Sauer,** Pacific Coast regional manager, Westinghouse appliance sales, and **W. T. Baker,** Western area manager with district managers in each city. The activity was initiated two years ago to establish rapport between headquarters-factory and field forces.

► **Residential use of electricity** in Colorado has stepped up sharply during the past year. Public Service Co. of Colorado's report for the 12 months ending July 31 shows that the average residential customer used 133.4 kwa more than he had during the previous year. San Luis Valley Division led, with an average increase of 158.2 kwh. Ft. Collins Division, which has the highest residential usage for all divisions, showed the smallest increase, 58.5 kwh.

► Consolidation by **Arvin Industries** of its electronics and appliances and furniture and housewares divisions into a single Consumer Products Division has been announced by Glenn W. Thompson, president. John C. Marshall, vice-president and former general manager of the electronics and appliances division, will head the combined operation.

New Towels for Old

Graybar Electric Co., Los Angeles, is staging approximately 50 "throw in the towel" demonstrations between Aug. 15 and the end of the year to introduce the new Norge home laundry, the AWD-502 Dispensomat.

To demonstrate the unit, dealers will invite housewives to bring in their old towels in exchange for new ones. The old towels will be ripped in half and one part will be washed in the Norge machine to illustrate the before and after effect.

Budget for each store will be about $70, exclusive of co-op ads. Graybar's campaign will tie in with the national newspaper, magazine, and TV barrage by Norge.

► Fourteen all-electric homes were displayed in **Hawaii's Parade of Homes,** Oct. 25-Nov. 2.

► **Don H. Burcham Co.,** in cooperation with V-M distributors in four Northwest states, presented the company's fall line at a three-day dealer meeting in Gearhart, Ore. About 80 attended, some of them coming from as far away as Butte and Great Falls.

► **Hotpoint** has created a new division-wide sales department, with John F. McDaniel at its head. At the same time, expanding its field sales force, it created five regions

A. C. Tyler (right), Seattle City Light's director of commercial activities, presents the first Medallion in the utility's service area to Builder E. B. Vick, who will build 12 others

NEW brochure of ideas for modernizing

This booklet is based on the premise that modernization can start anywhere in your plant. It can be a single machine or operation . . . a better way of getting variable speed . . . a faster way to braze . . . or a newly available replacement. In fact, this type of updating is far more common than the sweeping change.

Get a copy of "59 ideas for modernization in '59" from your nearby A-C office or write Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.

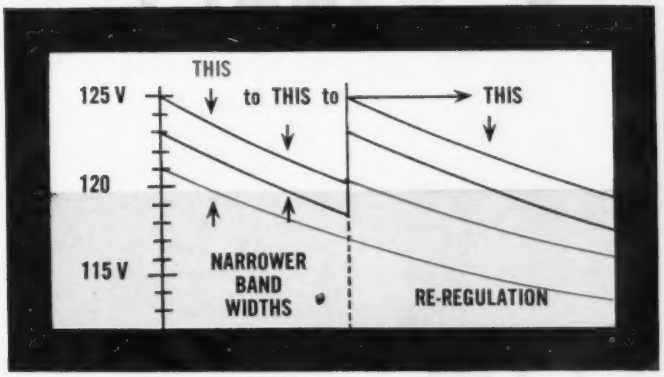
New motor development may eliminate premiums you've been paying for specially protected motors.

Electrical modernization includes placing substations close to machines being served.

ALLIS-CHALMERS

A-5850

LOADS DOWN?



Use this simple way to increase revenue

Narrow band widths

Re-regulation

Lower cost regulators

It's elementary — yet the revenue-producing potentialities of engineered regulation are only beginning to be capitalized. A 1-volt increase on feeders means $1 per customer per year increased revenue. With cost of regulation reduced as much as 50%, immediate profits are possible.

Here's what can be done on many feeders:

1. **Use Narrow Band Widths** — Two volts or less. Adjust regulator settings to keep voltage at the maximum.
2. **Re-Regulate Voltage** out on a feeder to bring even larger returns and improved customer satisfaction.
3. **Use Lower Cost Regulators**—New three-phase distribution regulators provide 30% saving. Utilize *Vari-Amp* for additional savings. Proper use or elimination of transformer taps adds a 5% saving.

Talk it over with an Allis-Chalmers engineer. Contact your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

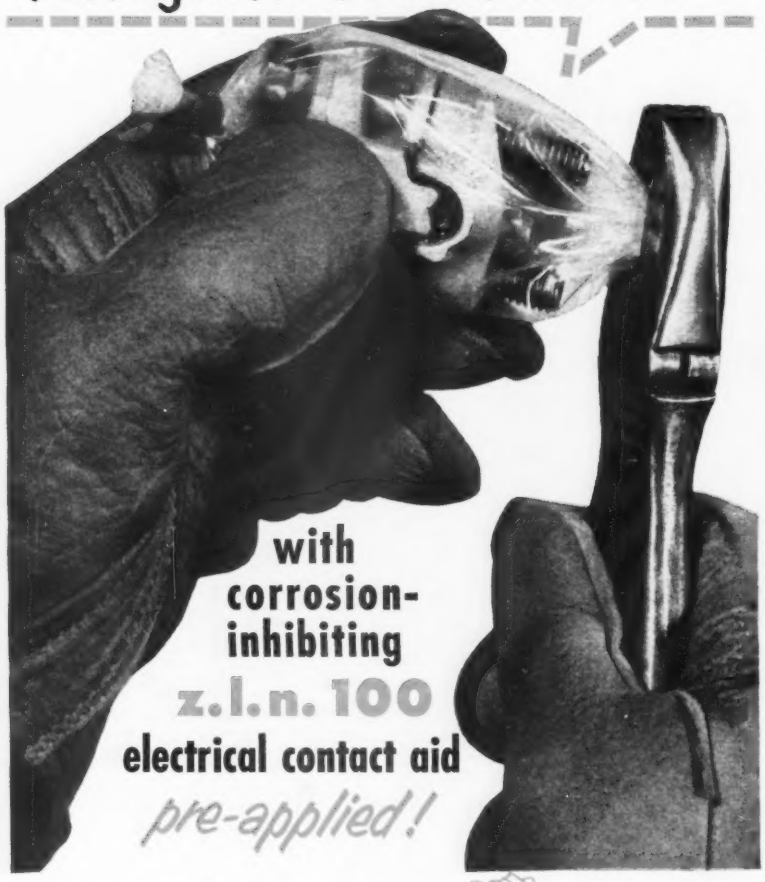
Get new technical article on economics of regulator application

Originators of 5/8% Step Regulators

ALLIS-CHALMERS

A-5798

Packaged for Circuit Protection!



All Chance Uniclamps -Parallel Groove Clamps -U-Bolt Connectors -and Hot Tap Clamps are now available in individual plastic packages with z.l.n.100 pre-applied! Clamp stays clean . . . sealing tape reminds lineman to wire-brush and apply z.l.n.100 to the conductor too!

A-B-CHANCE COMPANY

GENERAL OFFICES: CENTRALIA, MISSOURI
(A•B•CHANCE CO. of Canada, Ltd., Toronto)

CC58-9

and added 13 zone sales representatives. **L. E. Ankersen,** former manager, special markets, heads the new Western sales region.

► **Operation Snowflake** will be sponsored by U. S. Steel again this year. The fifth annual major appliance promotion by this company will begin on Nov. 17.

► The vacuum cleaner industry is considering adoption of a **commercial standard for method of rating commercial and industrial-type vacuum cleaners,** according to the Commodity Standards Division of the U. S. Department of Commerce.

Salespeople in the News

With change in name of Los Angeles Department of Water & Power's business agent's division to general sales division, **Robert H. Cockfield** will have the title of general sales manager instead of business agent.

Bernard C. Keach has been made Western regional manager for Dage Television Division of Thompson Products, with offices in Inglewood, Calif.

William G. Alexander is now assistant general manager of Stromberg-Carlson-San Diego.

M. A. Hoff has joined Hamilton Beach Co. as Western regional manager, with responsibility for the Pacific Coast states. He had been with Hotpoint as builder sales manager for the Western division, and before that was with G-E Supply in Los Angeles.

Leo J. Drahos has been promoted by the Hoover Co. to the post of Los Angeles branch maanger. He succeeds **John R. Duttenhofer.**

Frank D. O'Sullivan has formed his own distributing company to handle Ironrite automatic ironers in the southern California area. The new company, with headquarters at 215 West Pico Blvd., Los Angeles, takes over from Rite Distributors Inc., an Ironrite subsidiary, which operated at the same address.

M. G. Sues, president of Sues, Young & Brown, has announced that his firm has signed a franchise to distribute Typhoon air conditioning. In Los Angeles for the negotiation was Don V. Petrone, president of the Typhoon Division and of the Air Conditioning and Refrigeration Institute.

Robert Ford and **Frank Molina,** partners in the firm of Ford-Molina, have been appointed to represent the Dominion line in southern California. Headquarters are at 111 North Ave. 60, Los Angeles 42.

No. 18 in a series

Right off the Wire

A miniature record player only four by eight inches is capable of playing twelve inch records.

&

The record of many thousands of electrical installations shows that the use of TIREX cords and cables provides an extra measure of employee safety.

&

A new process removes helium from natural gas, in which it is a contaminant, by passing the gas through glass pipes, through the walls of which the helium is filtered.

&

An atomic-powered train has been designed that will travel across country without tracks. It has fifty-two wheels, each of which is electrically driven.

&

The plastic base of a new electric coffee pot completely encloses and waterproofs both heating element and thermostat.

&

Titanium alloyed with ranadium, chromium and aluminum makes a new alloy that is said to have the greatest strength for its weight of any structural material.

&

A complete picture, ready for transmission, is provided by a new transistorized television camera. It weighs only four pounds, including self-contained control and synchronizing units.

&

A radio telescope over four-hundred feet in diameter is planned for the hills of West Virginia.

&

Weather information can be transmitted over a thousand-mile range by an automatic radio station which can be dropped anywhere by an airplane.

&

An automatic electronic inspection machine makes a four-way check of automobile valves at the rate of 3,000 per hour with a tolerance of five millionths of an inch.

An adhesive has been developed that will retain a metal-to-metal bond at temperatures as low as −253 degrees C.

&

All cords and cables give better service when handled properly. TIREX® portable cords and cables, *although jacketed with fortified and tempered neoprene armor and "lead cured" for toughness and smoothness,* will give still longer service if not subjected to unreasonable abuse.

&

By making jet nozzles radioactive and measuring the radiation from the fuel passing through them, the amount of wear can be measured to within one millionth of a gram per hour.

&

Further information on these news items and on Simplex cable is available from any Simplex office. Please be specific in your requests.

&

A miniature battery which is reported to last for five years, uses the radioisotope Prometheum 147. It is suitable for hearing aids, watches or missile guidance systems.

&

In California, it is proposed to use underground steam to generate electricity as is being done in Italy and New Zealand. Wells are now being drilled and a yield of 100,000 kilowatts is anticipated.

&

Two radio manufacturers have built extra service into their sets. One warns of approaching tornadoes and the other acts as a radiation detector.

&

Deuterium, or heavy hydrogen, is concentrated by some bacteria from sea water. This discovery may lead to a new and inexpensive method of producing the heavy water used in reactors.

The area behind the eye that can not be examined by other instruments can now be seen by a device that uses penetrating sound waves and converts their reflection into light.

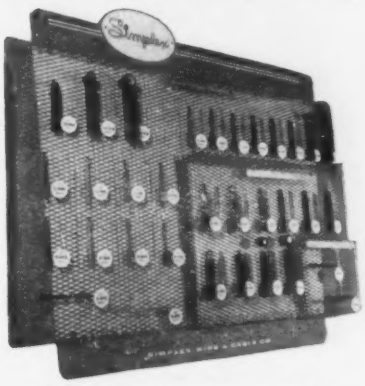
&

A disposable medicine container of heat-proof plastic doubles as a hypodermic syringe.

&

Our atmosphere at an altitude of sixty miles is now known to contain chemicals which could serve as an unlimited fuel supply for ramjet engines.

Visit Booth 162, 4th National Electrical Exposition, Dallas, Nov. 18-20



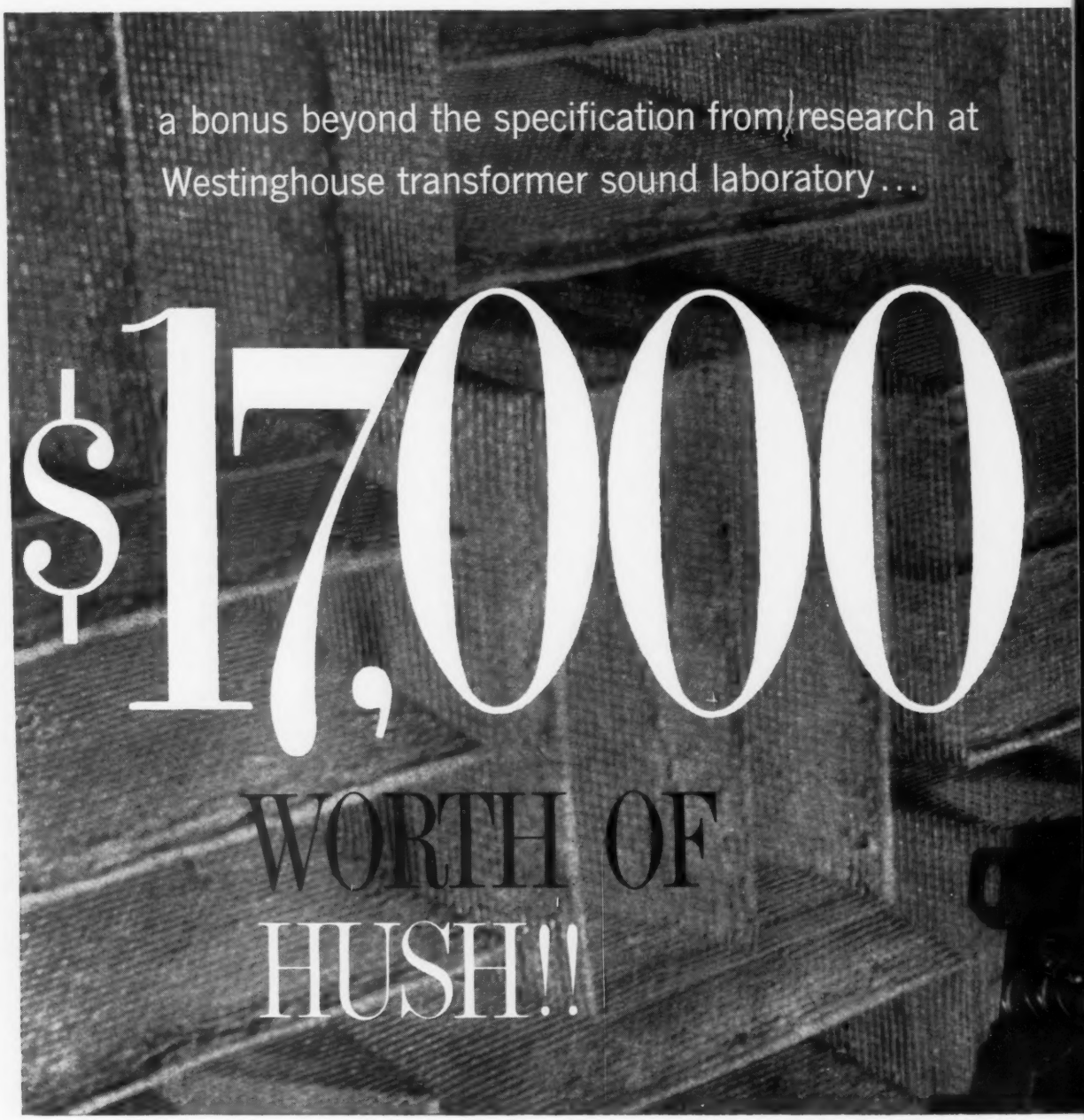
What's in a name?

The character and business integrity of distributors are measured to a great extent by the products they handle. More than 1000 of the nation's most successful electrical firms — offering the utmost in customer service and satisfaction — recommend and sell Simplex TIREX cords and cables.

SIMPLEX WIRE & CABLE CO.
Cambridge, Massachusetts and
Newington, New Hampshire

Simplex

Highest quality cables for: Mining
Power & Lighting • Construction
Transportation • Communications
Signalling



New reduced sound levels for Westinghouse power transformers eliminate price premiums for many installations

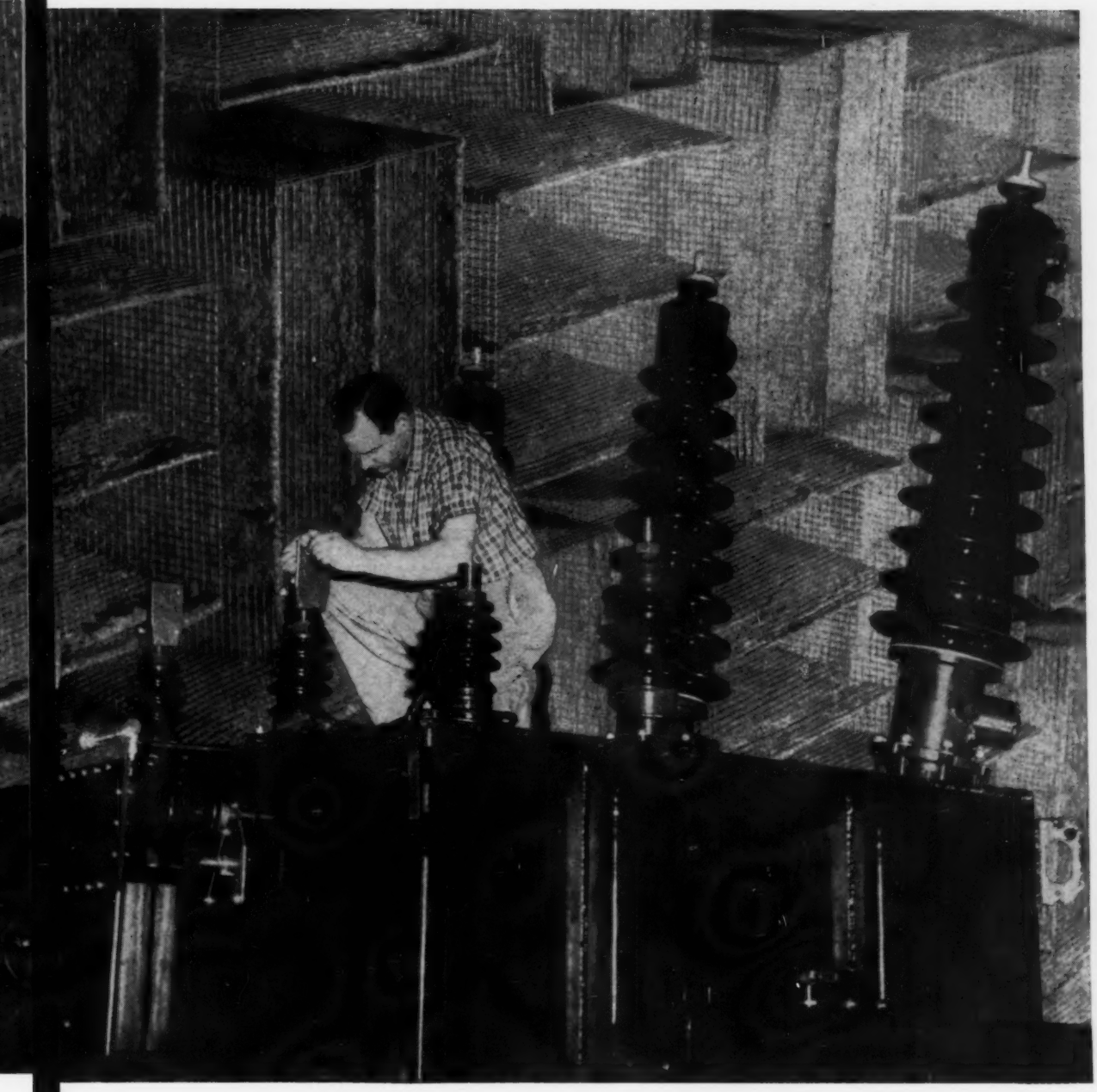
Announcing reductions of power transformer sound levels from one to nine decibels below NEMA levels, Westinghouse has again demonstrated its leadership in transformer development.

This means price premiums are eliminated for transformers built to these below-NEMA sound levels—sayes up to $17,000 on original transformer cost (for a 400-mva FOA transformer).

These savings were made possible through earnings plowed back into research . . . for studying and developing better means of reducing sound levels at the source—better design, new and improved methods and materials.

The major Westinghouse facility for researching sound is the vast anechoic chamber at Sharon. This laboratory—together with other high-power test equipment in Sharon's test center—permitted Westinghouse engineers to investigate sound control thoroughly . . . to evaluate sound dampeners . . . to evaluate barriers and complete enclosures . . . and to evaluate their efforts for reducing noise at its source, the transformer core.

From these test facilities came new reduced sound



levels—the result of improved materials and processing—modifications to steel formulations, handling techniques and core building combinations. The effect of each change was isolated in the sound lab, and its value thoroughly proved.

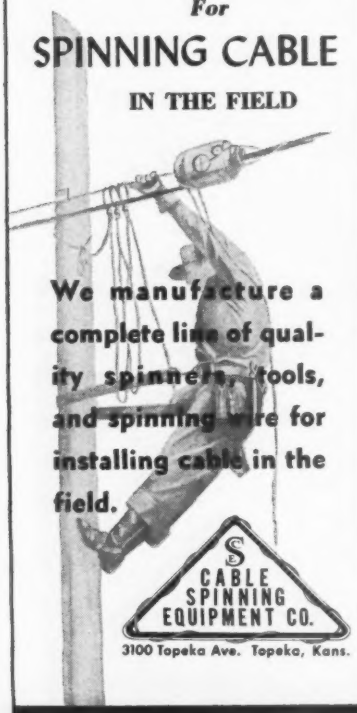
Shown here are typical examples of potential savings in transformer cost through the new reduced sound levels. Ask your Westinghouse representative about savings for your specific transformer application . . . another example of the real benefits produced through Westinghouse research—from earnings reinvested in the study of electric utility industry problems. J-70811

Typical Transformer Example	Recommended NEMA Sound Level in db	Westinghouse Sound Level in db	Reduction Guaranteed Sound Level in db	Percent Saving in Original Equipment Cost	Potential Dollar Saving on Original Cost
5000 kva Type OA 350 kv BIL or lower	67	65	2	12%	$ 3,800
10,000/12,500 kva Type OA/FA 350 kv BIL or lower	74	70	4	12%	$ 6,600
30/40/50 mva Type OA/FO/FOA 550 kv BIL	82	78	4	2%	$ 3,300
400 mva Type FOA 900 kv BIL	96	89	7	2%	$17,000

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

For
SPINNING CABLE
IN THE FIELD



We manufacture a complete line of quality spinners, tools, and spinning wire for installing cable in the field.

CABLE SPINNING EQUIPMENT CO.
3100 Topeka Ave. Topeka, Kans.

PHONE, WIRE or WRITE FOR INFORMATION

Over 100 specialists bring you...
THE MOST NEEDED DATA
IN ALL FIELDS OF
ELECTRICAL ENGINEERING

An encyclopedia of facts, figures, principles, data, etc. Covers power generation transmission, wiring design, standards, radio, electronic tubes, etc. Covers the most frequently used theories just as thoroughly as the latest practices in every major area of the field.

STANDARD HANDBOOK for ELECTRICAL ENGINEERS

Editor-in-Chief
ARCHER E. KNOWLTON
Consulting Engineer;
Consulting Editor,
ELECTRICAL WORLD
Assistant Editor
R. M. SHOOP
Associate Editor,
ELECTRICAL WORLD

Ninth Edition. 2230 pages, 6 x 9, over 1900 illustrations, over 600 tables, $19.50

JUST OUT: 9th Edition
● almost 2000 illustrations ● over 600 tables ● over 2200 pages ● 26 big sections.

Latest edition covers nuclear power, transistors, telemetering, etc.

Easy Terms: Pay only $3.50 in 10 days, then $4.00 monthly until $19.50 is paid.

10 Days' FREE Examination

McGraw-Hill Book Co., Inc., Dept. FWest, 11/58
330 W. 42nd St., New York 36, N. Y.
Send me Knowlton's STANDARD HANDBOOK FOR ELECTRICAL ENGINEERS for 10 days' examination on approval. In 10 days, I will (check one) ☐ send you the full price of $19.50; or ☐ $3.50, then $4.00 a month until the full price is paid. Otherwise, I will return the book postpaid. SAVE: We pay delivery costs if you remit with this coupon; same return privilege.
PRINT
Name .....
Address .....
City ..... Zone .... State .....
Company .....
Position ..... FWest
For price & terms outside U. S. write McGraw-Hill Intl., NYC

Manufacturers—Distributors

Forrest E. "Frosty" Pope has joined **Pfaff & Kendall** as Western sales manager, with headquarters at P. O. Box 249, Burlingame, Calif. Associated with the electrical industry for 23 years, Pope has for the past four years been a representative in the Bay area with his own agency. Previously he was with Porcelain Products for 15 years. In closing his agency, Pope gives up several lines, including Wheeler Reflector Co., Fanner Mfg. Co. and Bethea Co. He also had been representing P&K, which makes aluminum lighting and traffic standards.

Pope

► Appointment of two West Coast representatives for its Alrectic aluminum substations has been announced by **Handley-Brown** Co. of Jackson Mich. The new representatives are the **Industrial Engineering** & **Equipment** Corp., 2975 Wilshire Blvd., Los Angeles, and **William A. Horning,** 902 Friedel Ave., Vancouver, Wash. The former, headed by A. W. Jensen, has been assigned California, Nevada and Hawaii. Washington, Oregon, Montana and Idaho have been assigned to Horning. M. J. O'Laughlin, manager of substation sales for Handley-Brown, made a preliminary tour of West Coast utilities with the new representatives in September.

► **Peninsula Associates,** manufacturers' representative, has moved from 3150 Bayshore Highway to 1345 Hancock St., Redwood City, Calif., where it has larger quarters with showroom and instrument servicing facilities. The company has opened a branch office at 3215 Western Ave., Seattle.

► An expansion program that will more than double its capacity was announced by **Rundel Electric** Co., maker of custom-built electric control systems for industry. Cost of the expansion will exceed $100,000, M. S. Rundel, president, reported.

► **Calhoun-Poxon** Co., 5459 Alhambra Ave., Los Angeles, has been appointed sales representative for the **Furnas Electric** Co., Batavia, Ill., manufacturer of electric motor controls.

► B. T. Setchell, president of **Setchell-Carlson** Inc., manufacturer of Unit-Ized Television, announced the appointment of **Peyser** & Co., 1501 Weber St., Colorado Springs, as exclusive distributor for the Rocky Mountain area. Peyser & Co. will cover Colorado, east Idaho, Wyoming, New Mexico and the El Paso area of Texas.

► **Pacific Electric Sales** Co., 140 S. E. 28th Ave., Portland, has added the Red Snapper line of electric fence insulators manufactured by North Center Plastics Inc. of Ellendale, Minn.

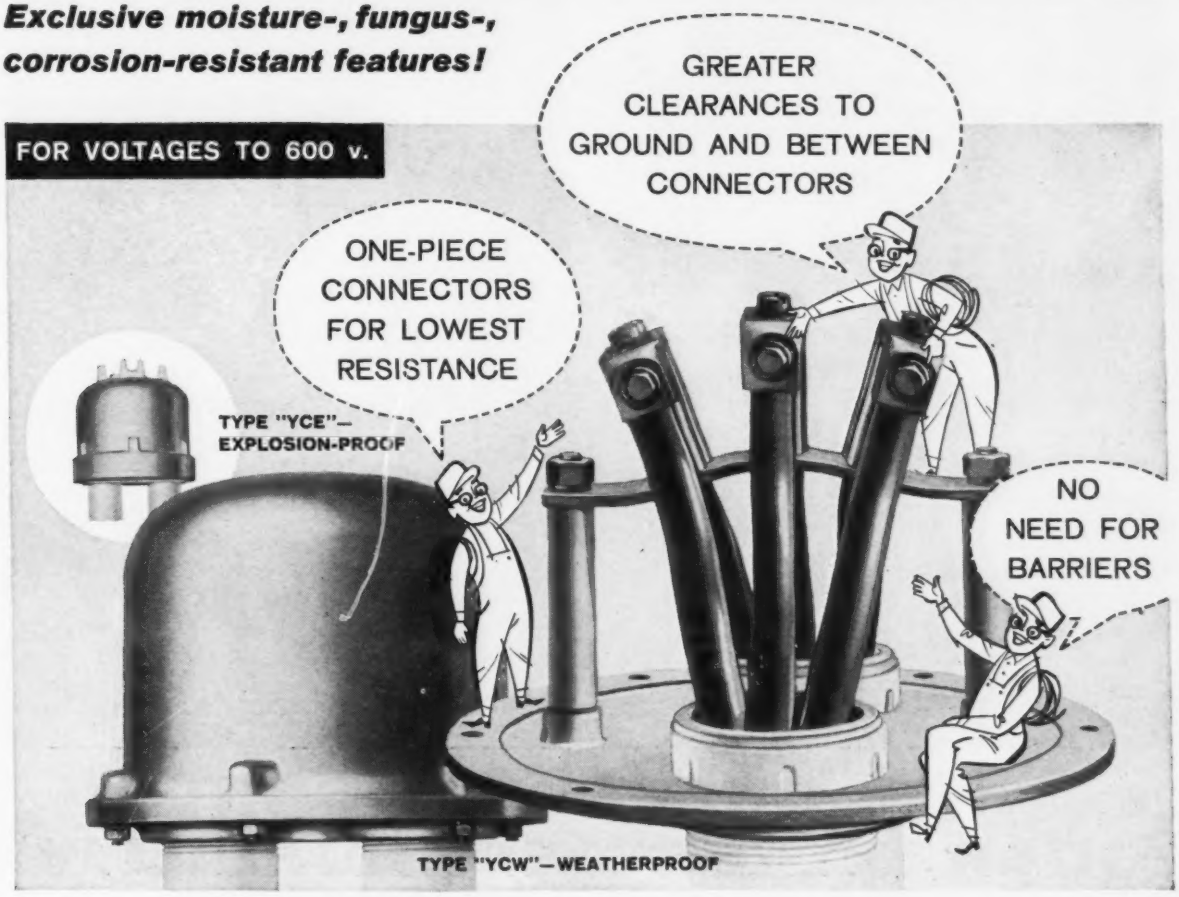
► W. E. Earl Sr., Portland, and R. M. Loughrey, Seattle, partners in **Don Burcham** Co., Portland, attended a four-day conference of manufacturer's representatives of Raytheon Mfg. Co. in Boston.

► Max White, formerly with Westinghouse Electric Supply, is now in

Graybar's new San Jose office and warehouse was opened recently at 1376 N. 10th St., the intersection of Bayshore and Eastshore Freeways. Some 400 attended the open house for this branch, Graybar's 136th office. Claude M. Perlewitz is manager

NEW! O.Z. PULL-N-SPLICE BOXES! CONVENIENT·COMPACT·ECONOMICAL

Exclusive moisture-, fungus-, corrosion-resistant features!


FOR VOLTAGES TO 600 v.
GREATER CLEARANCES TO GROUND AND BETWEEN CONNECTORS
ONE-PIECE CONNECTORS FOR LOWEST RESISTANCE
TYPE "YCE"— EXPLOSION-PROOF
NO NEED FOR BARRIERS
TYPE "YCW"—WEATHERPROOF

O.Z. Pull-n-Splice Boxes mark a significant advance in pull box construction!

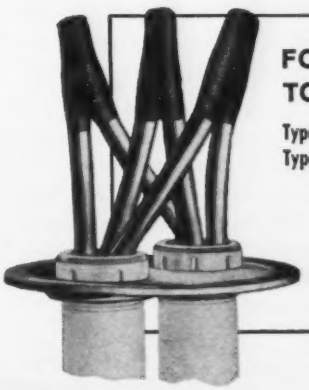
Their highly compact size saves *more space than ever!*

Their more efficient design means *new savings in installation time and labor!*

Their moisture-, fungus-, and corrosion-resistant features mean long, trouble-free service.

Still, with all their features, the new O.Z. Pull-n-Splice Boxes are *smaller* — and *cost far less* than conventional pull boxes . . . even late model *competitive* types! And, you get a bonus in high quality materials and workmanship so characteristic of *all* O.Z. products!

For complete information on these and the many other O.Z. products that mean more for you, call your local O.Z. distributor, or write to the company.



FOR VOLTAGES TO 5000 v.

Type "YPW" — Weatherproof
Type "YPE" — Explosion-proof

Deeper dome than "YCW" and "YCE". Furnished without connector panels. Insulated pigtail splices recommended.

O.Z. ELECTRICAL MANUFACTURING CO., INC.

262 BOND STREET • BROOKLYN 17, N. Y.

- CAST IRON BOXES
- CABLE TERMINATORS
- POWER CONNECTORS
- SOLDERLESS CONNECTORS
- GROUNDING DEVICES
- CONDUIT FITTINGS
- INTERLOCKED ARMOR CABLE FITTINGS

Sales Office and Warehouse: 406 So. Cicero Avenue, Chicago 44, Ill. • ESterbrook 9-0326
Office and Factory: 749 Bryant Street, San Francisco 7, Calif. • GArfield 1-7846

HILL CRAFTSMANSHIP GUARANTEES DEPENDABILITY

DISTRIBUTION TRANSFORMERS THAT GIVE "PLUS" YEARS OF SERVICE ARE STANDARD PRODUCTION AT HILL. "Inside" experience (coil experience) of highly-trained transformer specialists is the reason why Hill transformers stay in service. Each coil is wound to exact specifications by skilled, patient craftsmen. Couple their work with Hill advanced engineering design...meticulous care in every manufacturing detail. The result is extra years of on-the-job dependability.

UTILITIES BENEFIT from the new, modern Hill manufacturing facility—the only all-Western manufacturer of a complete line of distribution transformers.

COMPLETE STANDARD RANGE. Distribution transformers—3 to 500 KVA—are in regular production. Power and distribution transformers—Oil Filled, Askarel and Dry Types—are available through 5000 KVA. Manufactured to NEMA-ASA standards, Hill transformers carry a five year guarantee.

A copy of Hill's complete new distribution transformer catalog has been reserved for you. Request Catalog #2000

HILL

HILL TRANSFORMER CO., INC.
1030 WASHINGTON STREET
SAN CARLOS, CALIFORNIA

charge of **Bruce-Emmett** Co.'s Salt Lake City office with responsibility for covering Utah and Idaho for the firm's lines. He replaced David Merrill.

► **William J. Cottrell,** 4000 S. W. Macadam, Portland, whose firm recently took on the Ripley line of sunswitches, reports a trend toward putting individual sunswitches on each street light instead of having a string controlled by one unit. Reason: youngsters in some areas have found they can black out a whole series of street lights by holding a flashlight beam on the master sunswitch.

► Six members of the **J. A. Tudor** & Associates staff attended the international sales convention of **Allen-Bradley** Co., a once-every-three-years event. This meeting was at Nippersink Manor, Wis., a resort hotel between Milwaukee and Chicago. Attending from the Seattle office were J. A. Tudor, John Marshall and Dayne Hansen; from the Portland office, William Meyer, Edward Hurd and Gerald Coons.

► **Al Thompson,** Denver manufacturers' agent, has added the **Smithcraft** fluorescent line. Thompson also represents Prescolite Mfg. Corp. in Colorado, Wyoming and western Nebraska.

► At Denver, **General Cable** Co. has won two major contracts that will be handled by its distributor, **Ryall Electric Supply** Co. The largest is to supply all wire for the line and the four launching pads for the Atlas missile base at Cheyenne, Wyo. This is a $65,000,000 plus construction project. The other is for wiring for the 1,000-room Denver Hilton Hotel now under construction by Webb & Knapp Inc. of New York City.

► **G. E. Ralston,** vice-president and director of sales for Rome Cable Corp., was in Denver in late October to call on utility and industrial firms.

► **Landes, Zachary & Peterson** Co. of Denver has added two lines in its electrical instrument division. One is the **Premier Instrument** Corp. of Port Chester, N. Y., whose principal products are wave guides. The other is the vibro ceramics division of **Golden Industries,** Metucheon, N.J., manufacturer of ultrasonic equipment.

► Joe Marsalisi Jr. has been named California district manager for **Chambers Built-Ins.** His headquarters are in Woodland Hills, Calif.

Federal Pacific salesmen from all over the United States attended a company switchgear conference in San Francisco. Attending the five-day conference to learn about new switchgear products were: Front row—R. L. Zipprich, manager, customer services; T. H. Orrock, manager, oil circuit breaker and bushing sales; G. A. Dusch, manager, divisional sales; R. Altman, divisional sales; J. E. Samuelson, manager, air switching equipment sales; R. J. Durkin, Chicago; J. W. Wilkins, branch manager, Pittsburgh; G. E. Granger Jr., branch manager, Richmond, Va.; M. E. LaMont, Minneapolis. Standing—C. G. Jewett, Cincinnati; W. J. Smith, switchgear technical specialist; F. T. Ritter, Atlanta; B. G. Richards, Pacific agent, Curtis Musgrove Co., Dallas; J. H. Schweizer, Newark, N. J.; L. S. Keller, New York City; W. E. Farrell, manager, transformer sales; M. C. Bonine, manager, Pacific Switchgear Division; J. J. Dugan, district manager, Detroit; L. C. Culver, agent, Mid-South Sales Co., New Orleans; B. J. Stimpson, Los Angeles; H. L. Brooke, assistant manager, divisional sales; J. J. Espey, Baltimore

---

► **R. D. Florance & Associates** of Denver has added to its lines underfloor wiring ducts made by **Orangeburg Mfg. Co.,** New York City.

► **Tri-State Supply** Corp. is now representing the **Polyglass** line of high temperature transformer spacers and armature wedges, as well as specially shaped electrical and electronic bobbins.

► **Smoot-Holman,** Los Angeles, has revised upward its previous estimates on the cost of its paint facility, which is scheduled for completion soon after the first of the year. Earlier, the company had intended to invest $175,000. However, it was decided that additional building and machinery would be profitable, and the new estimate runs to $250,000. One of the largest cost items will be additional Randsburg paint process equipment.

► Saving of about 21 man-hours a day is reported by G. Edward Byers of **California Wholesale Electric,** Los Angeles, since the firm installed a communication system in September. Each of the 14 people on the company's order desks is provided with a handset that has direct connection to the stock records. Three people at the stock cards can readily check any desired information without the necessity for those on the order desk to take the 40- to 50-ft trek to the records. The system also connects to the shipping room.

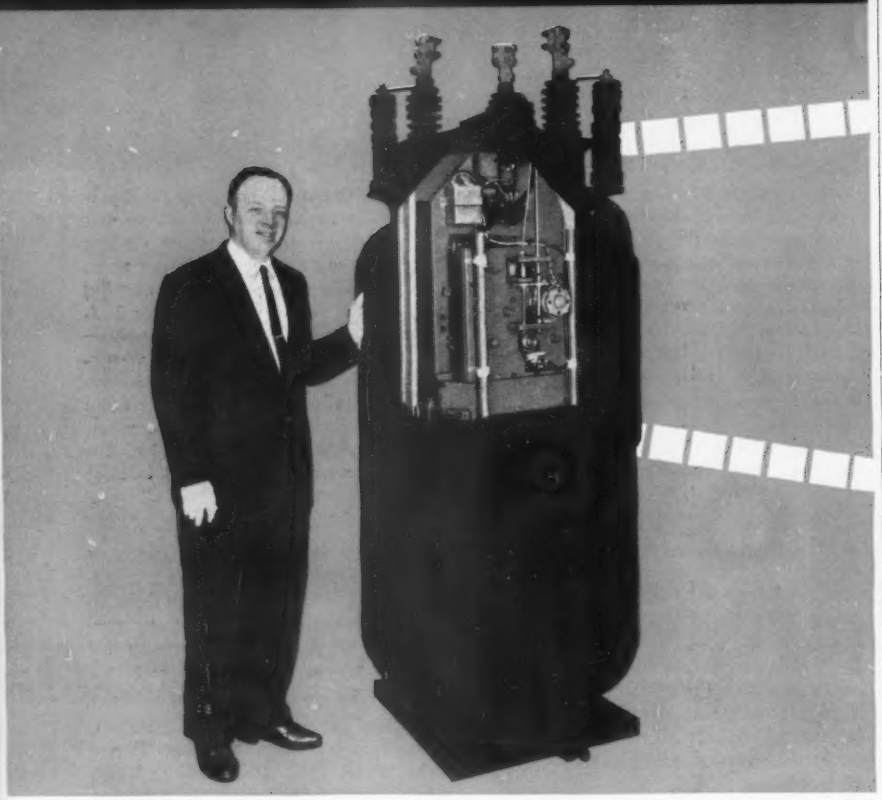
► **Union Metal Mfg.** Co., Canton, Ohio, has appointed the **Taper Tube Pole** Co., 1048 Monadnock Bldg., San Francisco, as sales representative in northern California and northern Nevada. The firm will handle sale of Monotube street and highway lighting poles, floodlighting poles, overhead sign supports and other related products. Clinton deWitt is president, L. F. Krusi vice-president.

► Will C. Hall, president of **Moffett Engineering** Inc., Albany, Calif., has announced the appointment of **Engineered Process Equipment** Co., 774 E. Green St., Pasadena, as manufacturer's representative for Moffett custom-built cranes in southern California, southern Nevada, Arizona and New Mexico.

► **Robert E.** "Scotty" **MacKinnon** has joined the industrial sales staff of James L. Kearns Co., Portland.

Ask your Westinghouse representative
about the exclusive benefits you get from

URL AND URF REGULATORS... "LIKE NEW" PERFORMANCE FOR TOMORROW'S LOADS



In Westinghouse URL and URF regulators, carbon accumulation *cannot* clog cooling ducts. Changing taps under load in a regulator requires interrupting an arc under oil and this arcing causes the release of free carbon. If not restrained, this accumulation *can* clog cooling ducts, reducing cooling efficiency and stealing load-carrying ability. Under heavier loads more carbon is released and in time overheating may become a problem.

A separate tap changer compartment in each URL and URF regulator keeps carbon out of the main tank oil. This prevents carbon build-up in the cooling ducts . . . cooling efficiency and load-carrying ability remain high.

In feeder voltage regulators, only Westinghouse URL and URF regulators offer a separate tap changer compartment — at no extra charge. Here is your assurance that the full value of *like-new* performance will still be yours — even ten or twenty years from now.

See your Westinghouse representative for the full story of better regulation — from URL and URF regulators — made possible through PLOWBACK OF EARNINGS into research for the solution of the electric utility industry's immediate and long-range problems. J-70895

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS." CBS TV MONDAYS

He will specialize in industrial maintenance and operation problems. The company recently was appointed exclusive Northwest engineering representative for Electric Switch Corp. of Indianapolis, Ind.

► **Gough** Industries has announced appointments to the Electrical Supply Division: **J. F. Hrabetin**, vice-president, general manager; **E. E. Karsten**, vice-president, administrative officer; **G. S. Woodill**, general sales manager; **J. S. Roberts**, assistant general sales manager.

► **Westinghouse** has appointed two new industrial agents in the West: **Machinery Center,** 1201 S. 6th West St., Salt Lake City (Roger V. Pierce, president), and **Sutherland Electric,** 4411 S. E. Belmont St., Portland (G. H. Sutherland, owner-manager).

► **William Cereske** Co. is moving into enlarged quarters at its present address, 1401 Middle Harbor Road, Oakland, Calif. With about 18,000 sq ft, the company will have three times the office space, a five-ton overhead crane. Established 12 years ago, the company handles electric wire and cable. Inventory has doubled within the past 12 months, according to William Cereske, president.

► **Robbins & Myers,** Springfield, Ohio, electric motor manufacturer, has purchased **Trade-Wind Motorfans** Inc. of Rivera, Calif. The Trade-Wind sales force will remain under the direction of the Hunter Division-Robbins & Myers in Memphis, according to Frank S. Brady, general manager and vice-president.

► **J. M. Fincke,** Los Angeles manufacturers' representative, has taken on the **L. A. Mason** Co. line of Red Dot aluminum conduit fittings. From its offices at 1848 N. Main St., Fincke will cover the areas of southern California, southern Nevada and Arizona.

► **Don H. Burcham** Co., Portland, has been named representative for **Jerrold Electronics** Corp., Philadelphia, in the four Northwest states and Alaska. Jerrold specializes in community TV systems.

► **J. E. Edstrom** Co., Portland, has added the Leland Electric Co. lines to the products it represents in the Northwest. Edstrom will handle Leland motors and generators, manufactured by the Leland Division of American Machine & Foundry Co., in Oregon, Washington, northern Idaho and western Montana.

People

Malloy

Gregory

Chance Co. Changes

Three changes in its Western regional marketing division have been announced by A. B. Chance Co.

Warren Gregory has joined the company as line construction materials sales representative in northern California and northern Nevada. He will headquarter in the San Francisco area.

Mayers

Robert W. Mayers, who has been a field engineer, has been appointed an apparatus sales representative, also working out of the San Francisco office.

C. E. "Bud" Malloy, formerly sales representative in San Francisco, has been transferred to Los Angeles to work in the southern California, southern Nevada and Arizona area.

► **Jubal A. Hale,** vice-president and for many years chief operating officer of Utah Power & Light Co., recently announced his retirement after more than 45 years' service with the utility. In recognition of his many years of service, the company in 1950 named a steam-electric plant at the mouth of Provo Canyon the "Hale Plant." Hale will continue as a member of the UP&L board of directors.

► **W. L. Vinson** has been re-elected financial secretary and business manager of IBEW Local 125 in Portland. Other officers elected were: **E. W. Harvey**, president; **William C. Miller Jr.**, vice-president; **Floyd D. Parker**, recording secretary; and **V. P. Chandler**, treasurer.

► **Vard E. Larson**, a native of Utah and veteran employee of the Bureau of Reclamation, has been appointed assistant project engineer for the Glen Canyon Dam.

► **A. E. Rhodes** has been appointed manager of power production for Public Service Co. of New Mexico. He formerly was with the Atomic Energy Commission at Los Alamos as chief of utilities operations.

► **Jim E. Erskine,** formerly with S & C Electric Co. in Burlingame, Calif., has joined Randolph Engineering Corp., San Gabriel, as an application engineer.

► **Donald W. Franzen,** an Oregon State College electrical engineering graduate, has joined Pacific Power's Portland staff as an assistant system resources engineer. He is assigned to PP&L's power contracts division.

► **James G. Bouska,** assistant branch sales manager in San Francisco for Exide Industrial Division, Electric Storage Battery Co., has been appointed sales manager of the Los Angeles branch.

► **Richard B. Smith** of Anchorage has been re-elected president of the Alaska Rural Electric Cooperative Assn. He is a director of Chugach Electric Assn.

► **W. T. R. Saari** is new Seattle district manager for Bruce-Emmett Co. Saari, formerly lighting manager for Stubbs Electric Co., Portland, will be assisted in Seattle by **Gerry Lauri**.

► **Harold H. Henninger** has been appointed assistant to the president of Pacific Power & Light Co. A veteran of 22 years with P P & L, Henninger is well known in the timber regions of Washington, Oregon, Idaho and Montana, where he has traveled extensively as the company's forest industries sales specialist, an assignment he has had since 1954. Louis P. Growney, industrial engineer for PP&L, will assume the forest industries sales work.

Henninger

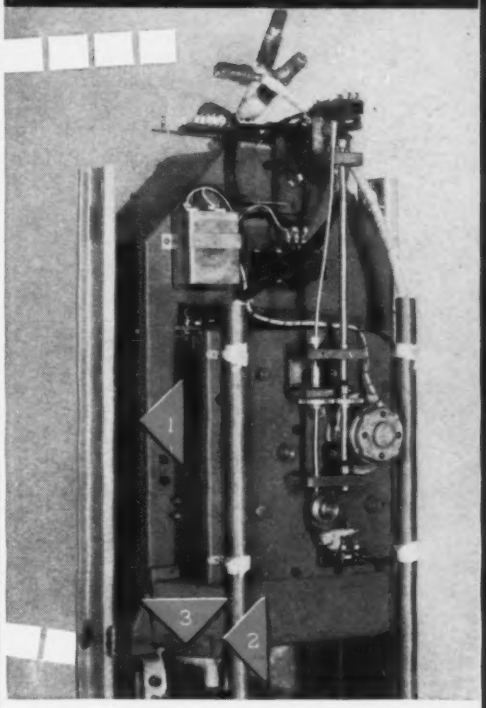
► **C. E. Dunahoo** has been appointed safety director for San Diego Gas & Electric Co. He succeeds the late **James E. Smith.**

► **Ronald F. Simmerley,** president of Industrial Electric Supply Co. in Tulare, Calif., died of a heart attack July 18. He had at one time been connected with the T. L. Rosenberg Co. in Oakland.

Exclusive separate

tap changer compartment

GUARDS SYSTEM LOAD CAPABILITY



The separate tap changer compartment built into your Westinghouse URL or URF regulator is your assurance of peak operating efficiency — now, and *for future loads.* Here are the three basic construction features that provide constant service reliability with minimum maintenance:

1. Felt gasketing keeps carbon out of the main tank and permits equalization of the oil level at all times.
2. Sump collects sediment which is easily, quickly drawn off.
3. Separate external drain facilitates renewal of oil in tap changer compartment.

Only Westinghouse URL and URF regulators (available in sizes 250 kva or below) offer all these bonus values of the separate tap changer compartment for distribution-type regulators. J-70896

YOU CAN BE SURE...IF IT'S

Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

SPECIAL ZINC-RICH COATING GIVES GALVANIC PROTECTION TO METALS

Galvanox is a special coating composed of an extremely high percentage of metallic zinc in an organic binder. The resulting film supplies an electro-chemical type of protection long associated with galvanizing. Applied as a paint, it dries and "cures" to form a very dense coating of metallic zinc.

Galvanox comes ready-mixed in a natural zinc color only and has specialized uses and applications, as:

- For replacing galvanizing
- For reconditioning galvanizing
- For covering arc welds and welding
- For use in conjunction with cathodic protection
- For use as an electrical conductor
- For minimizing electrolysis
- For use as a metal filler
- For underwater, underground or high humidity exposures.

Learn more about the application of Galvanox and its low cost. Write today for a copy of "Galvanox by Subox."

SUBOX PAINTS

Subox Inc.

Established 1924
3 Fairmount Plant
Hackensack, N. J.

► **Roger J. Delander** has been appointed general sales manager of Leadlight Fixture Co. Delander was previously Western regional manager for Sylvania Electric Products Inc., lighting fixture division, with many years in the lighting fixture business. He will headquarter at the home office of Leadlight Fixture at 800 100th Ave., Oakland, Calif.

Delander

► **Lee Bornstein** has joined Walker Scott Co. in San Diego as manager of the major appliance and food plan operation. **Ray Murray** has taken his former post as manager of Approved Appliance Service.

► **William Marsden,** a partner in Marsden's, Pacific Beach, has been elected president of the **San Diego Bureau of Home Appliances**. Other officers are: Ben Jacobson, Cabrillo TV & Appliance, first vice-president; A. R. Combs, Wedgewood-Holly Appliance Co., second vice-president; Jerry Heilbron, Heilbron Electrical Co., treasurer; Sam L. Hall, Electric Supplies Distributing Co., immediate past president.

C. R. McCarty, former sales manager, has been named to the newly created post of executive vice-president of Kierulff & Co. Other appointments announced by President Charles R. Kierulff are: Sam Grasinger, vice-president of the Motorola Home Products Division; W. R. Brittle, vice-president, Webcor Division.

► **George A. Hill** has been named manager of Arizona Public Service's electric market development services. He was former northern division sales manager.

► **William S. Gookin**, chief engineer for the Arizona Interstate Stream Commission, is new administrator of the Arizona Power Authority. He succeeds **K. S. Wingfield**, who retired to re-enter the consulting engineering business.

► **John Leighton** has been appointed program control engineer and head of British Columbia Power Commission's new program control division, engineering branch. He comes to the commission after 10 years with Ontario Hydro.

For multiple circuit street lighting...

THESE 9 ADVANTAGES MAKE KW® ALUMINUM CABLE YOUR BEST BUY!

- **Lighter weight than copper for equivalent current-carrying capacity**
- **Light weight simplifies installation handling**
- **Light weight reduces shipping, handling costs**
- **Easy to bend, form, train and cut**
- **Simple to splice, tap and terminate**
- **Lower overall cost per foot**
- **Excellent resistance to weathering**
- **Excellent flex characteristics**
- **Backed by 68 years of cable and insulation know-how**

To offer utilities greater cable values than ever before, KW has brought its pioneering development in aluminum conductors together with the 68 years proved experience of "the masters of insulation" (formerly U. S. Rubber Wire and Cable division).

For multiple-circuit street lighting systems, KW recommends the constructions described at right. And for wire and cable to fill any utility requirement, call on KW specialists through your KW distributor or Kaiser Aluminum Sales Office.

Kaiser Aluminum & Chemical Sales, Inc., *Executive Office*, Kaiser Bldg., Oakland 12, Calif.; *General Sales Office*, Palmolive Bldg., Chicago 11, Ill.

KAISER ALUMINUM

IF IT CARRIES CURRENT, KW CARRIES IT!

SEE "MAVERICK" • SUNDAY EVENINGS, ABC-TV NETWORK

Power Supply Cables—Aluminum Conductor

Single or multi-conductor cables, stranded aluminum, sizes 4 AWG and larger, up to 15 KV, shielded or non-shielded.

Specification No. 838-S
Hydrosec® insulation—Neoprene jacket.
For wet or dry locations up to 75° C. Type USE, Style RR, up to 600 volts.

Specification No. 831-S, up to 15 KV
Kalzone insulation—Neoprene jacket.
For wet or dry locations up to 90° C.

Pole and Bracket Cables—Aluminum Conductor

For use in circuits where voltage between conductor and ground does not exceed 600 volts. Sizes 8, 10 and 12 AWG, 7 strand aluminum.

Specification No. 819-S
Street lighting cable, Neoprene type,
Figure 8 Ziplite construction.

Specification No. 820-S
Performance insulation—weatherproof braid.

Specification No. 838-S
Hydrosec® insulation—Neoprene jacket. Type USE, Style RR.

Specification No. 202-S
Type UF Cable, PVC insulation—PVC jacket.

Specification No. 942-S
Laytex® insulation—Neoprene jacket,
Figure 8 Ziplite construction.

Slam it closed "blind"...

this cutout never misses!

The lineman doesn't have to steer the fuse tube into the contact of S&C's XS Cutout

If the lineman closes into a *fault* and misses—where is the lineman?

If he closes into a *load* and misses—what can the lineman do?

Even an experienced lineman shouldn't be expected to steer a cutout closed; for safety's sake, he must look away.

For positive steering when closing, the fuse tube of S&C's XS Cutout is controlled in four ways:

(1) The tube trunnion is thrust firmly forward into pockets in the hinge by the contact springs.

(2) The tube trunnion is simultaneously stabilized by the hinge's inner surfaces acting on the vertical faces of the trunnion casting.

(3) At the same time, guide edges of the hinge steady the corresponding edges of the lifting eye in the tube trunnion casting.

(4) LOADBUSTER® attachment hooks act as guides to steer the fuse tube as it "wipes in" and seats positively.

These four elements provide certain closing action, even when slammed home blind. And on dark and windy nights, closing is a sure thing, without hang-ups or damage.

For full information about the XS Cutout and its use with LOADBUSTER for load switching, write for Bulletin 511 to S&C Electric Company, 4425 Ravenswood Ave., Chicago 40, Ill. In Canada: S&C Electric Canada, Ltd., 8 Vansco Road. Toronto 14, Ont.

S&C DISTRIBUTION CUTOUTS

Disconnects • Cutouts • LOADBUSTER® • Interrupters
Metalclad Switchgear • Fuse Links • Power Fuses

Avery

Unger

► **L. Burt Avery** has been promoted to vice-president and general manager of Sequoia Wire & Cable Co. In this capacity, he assumes full responsibility for operations both in the headquarters plant at Redwood City and the cable and electronics facility in Burbank. **Donald J. Unger,** former production control manager, has been named plant manager. He will supervise all production and related operations.

Sales District Formed

Fluorescent Fixtures of California has formed a new San Francisco sales district that will be headed up by Fred J. Bertolone.

New sales assignments in the area go to M. J. Hooey, covering Alameda and Contra Costa Counties; Bill Eliot, covering San Francisco, Marin and the North Coast area.

► **John Brass Jr.** was named auditor of division accounts for Pacific Gas and Electric Co. He succeeds **Harry McGann,** who will continue until retirement as special assistant to comptroller **L. W. Coughlin.**

► **John C. Washington** has been named manager of the Los Angeles district for the Weston Instruments Division of Daystrom Inc. He will supervise all sales and district office operations in southern California and parts of Nevada.

► **Richard A. Talbot,** assistant purchasing agent for Pacific Power & Light Co., has retired after 34 years as a utility buyer. Talbot was formerly purchasing agent for Mountain States Power Co. until its merger with PP&L.

► **Wilson A. Pritchett** has been appointed chief engineer of Knopp Inc., Oakland, Calif., manufacturer of precision electrical testing equipment. Pritchett received his M.S. degree in electrical engineering from Oregon State College, and has for the past 10 years been a professor in electrical engineering at the University of California, Berkeley.

Reorganization

Seattle City Light has reorganized its accounting division into two main subdivisions, one headed by Arnold Amundsen, the other by Melvin A. Anderson. Both report to Charles Benson, director of finance.

Amundsen is in charge of general utility accounting and machine accounting. Anderson is in charge of revenue accounting and credit sections and is responsible for budgeting, internal auditing and special services.

► **E. J. Stephens** has been appointed to the position of general sales manager of Sequoia Wire & Cable Co. He will headquarter in the firm's executive offices in Redwood City, Calif. Stephens was formerly district manager for the Okonite Co., and responsible for the major marketing areas of the northwestern U. S. and the Pacific. He is a member of AIEE, and holds a degree in business administration from the University of California.

Stephens

► **Oscar Meissner** will succeed the late A. T. Nadeau as director of the Los Angeles Bureau of Street Lighting.

► **Paul B. Smith** has been appointed a resident engineer in Portland for Bailey Meter Co. His headquarters are at 825 N. E. 131st Place, Portland 30. Smith is a graduate of the University of Illinois, with a B.S. degree in mechanical engineering. He has been with Bailey Meter since 1946, and was assigned to the San Francisco district office the following year. In 1957, he was assigned to the Seattle office.

Smith

► **Fred C. Hall** has been made vice-president and sales manager of McCabe-Powers Auto Body Co. of Berkeley, Calif. He formerly owned the Fred C. Hall Co., San Carlos, and Halline Equipment, which is now owned by McCabe-Powers.

Heerdink

Buurma

► **Edward C. Buurma** has been appointed to the post of manager for Ceramicite Products of Sequoia Wire & Cable Co. At the same time, **Robert Heerdink** was named manager of communication products. Ceramicite is the name given to a flexible ceramic insulation that will be used on wire products for high temperature requirements.

Sierra Pacific Promotions

Frank Gaiennie is new district manager of the Truckee division of Sierra Pacific Power Co. Stan Martin becomes manager of the Carson division, and Fred Talley will succeed Martin as manager of the Lovelock division.

Gaiennie has been with the company for 36 years. Martin joined the company in 1926, and Talley in 1947.

► **Edward F. Fox** has been appointed director of public information for regional offices of the British Columbia Electric Co., Vancouver, B. C. He joined the company 13 years ago after many years in newspaper work.

► **Alvar L. Hendrickson** has been appointed manager of the Wahkiakum County PUD at Cathlamet, Wash. He succeeds John S. Dickson, who resigned because of ill health.

► **Vernon K. Pitts** moves from Palo Alto, Calif., to Seattle to be Pacific Northwest manager of General Electric apparatus, credit and collections.

DEATHS

► **Rainey Von Lossow,** district engineering manager for Westinghouse Electric Corp., died recently at Nimpo Lake, B. C., after a heart attack. He was a native of Missouri, and moved to Seattle in 1918.

► **Oscar M. Chagnon,** director of the Los Angeles Chapter of NECA and prominent in the industry for many years, died of a heart attack at his home in Arcadia, Calif.

APPARATUS SALES ENGINEER

Large electrical manufacturer of switchgear, unit substations, transmission and distribution switching and protective equipment needs services of Apparatus Engineer for the West Coast location. Duties will consist of contacting electric utilities on the West Coast with our established field organization, specifically to do product line sales promotion work on high-level engineering basis. Man chosen will be graduate Electrical Engineer, 30-45 years of age, with successful engineering, operation or sales experience with class of equipment listed. Travel required 60-70% of the time. Home week-ends. Substantial opportunity. Refresher training provided initially and periodically. Address replies to:

Box Number 298, Electrical West, San Francisco 4, Calif.

Giving complete resume of experience and financial history.

REGIONAL SALES MANAGER

Headquarters in Los Angeles
Exceptional opportunity for fully experienced man to take over supervision of existing sales organization—covering 11 Western States—for nationally prominent manufacturer of Incandescent and Fluorescent lighting equipment.
Newly established manufacturing facilities in Los Angeles assure good service and rapid deliveries . . . supported by strong promotional backing. Send full details of background in complete confidence to Box No. 297, Electrical West, 68 Post St., San Francisco 4, Calif.

GIVE THROUGH YOUR UNITED FUND OR COMMUNITY CHEST
UNITED

Associations

Considering Changes

That work has been started on revisions to the California Electrical Safety Orders was announced at the Southern California Chapter, IAEI, meeting in May by William Potts of the Division of Industrial Safety. Suggestions for changes in the orders will be considered, he said.

Among topics in the meeting, presided over by S. G. Marrocco at Santa Barbara, was that of control cables containing large numbers of conductors. Such cables are used in automation applications. The code limitations as to number of wires permitted in a conduit are in conflict with such multiple conductors. The meeting came to no conclusions but the codes permit no deviations at present.

Officers Elected

In Western regions of the IES, the election of officers announced for the new year are the following: Vice-president for Pacific Northwest Region, Beverly A. Travis, consulting engineer, Seattle; Arizona Section chairman, R. E. Tweedy, Phoenix, vice-chairman, R. W. Godemann, secretary, S. S. Lambe; B. C. Section, E. N. Kolbeins, Vancouver, chairman, H. G. Foster, vice-chairman, and M. M. Hawkey, secretary; Golden Gate Section, John C. Epperson, San Francisco, chairman, W. G. Bayha, vice-chairman, Frank E. Duhme Jr., secretary; Oregon Section, D. W. Shirley, Corvallis, chairman, J. A. Schulter, Portland, vice-chairman, F. A. Farley, secretary; Puget Sound Section, R. E. Jones, Seattle, chairman, G. D. Wirt, Bremerton, secretary; Rocky Mountain Section, L. S. Reed, Denver, chairman, G. H. Patterson, Denver, vice-chairman, Carl S. Long Jr., Denver, secretary; San Diego Section, R. W. Rohrback, San Diego, chairman, E. L. Peterson, vice-chairman; Southern California Section, Frank B. Lee, Los Angeles, chairman, B. J. Hartmann, vice-chairman, Edward Balogh, secretary-treasurer; Utah Section, J. W. Lowder, Salt Lake City, chairman, J. H. Shaw, vice-chairman; Mother Lode Chapter, Charles A. Dean Jr., chairman, Earl E. Storrs, Stockton, vice-chairman, Elton L. Harris, secretary-treasurer; San Jose Chapter, G. Rex Gardiner, chairman, George E. Smedberg, vice-chairman, Peter Darnton, secretary-treasurer.

INDEX TO ADVERTISERS
November 1958

Allis-Chalmers Mfg. Co. 57, 100, 101
Anaconda Wire & Cable Co. 18, 44
Anderson Electric Corp. 25

Blackburn Corp., Jasper 41
Blakeman Bros. Elec. Mfg. Co. 40
Burndy Corp. 23

Cable Spinning Equip. Co. 106
Chance Co., A. B. 102
Classified 116

Fanner Mfg. Co. 117
Federal Pacific Electric Co. 37

General Electric Co.:
Cleveland, Lamp Div. 33
Schenectady, Apparatus Div. 34, 35, 42, 43, 50 51, 93
Greenlee Tool Co. 12

Hill Transformer Co. 108
Hotpoint Co. Div. G.E. Co. 48

Indiana Steel & Wire Co. Inc. 22

Johns-Manville 36

KPF Electric Co. 46, 47
Kaiser Aluminum & Chemical Corp. 29, 49, 113
Kearney Corp., James R. 16, 17
Klein & Sons, Mathias 14

Lapp Insulator Co. Inc. 94, 95
Lighting Dynamics 118
Line Material Industries 3

Moloney Electric Co. 6

Okonite Co. 97
Orangeburg Mfg. Co. 87
OZ Electrical Mfg. Co. 107

Pacific Coast Electrical Association ..... 4th Cover
Pacific Gas and Electric Co. ..... 3rd Cover
Paranite Wire & Cable Div., Essex Wire Corp. 52
Pennsylvania Transformer Co. 38, 39
Phelps-Dodge Copper Products Corp. 32
Preformed Line Products Co. 30, 31

R T & E Corp. 98, 99
Rockbestos Products Corp. 21
Roebling's Sons Corp., John A. 55
Rome Cable Corp. 8, 9, 11

S & C Electric Co. 114
Sangamo Electric Co. 26, 27
Simplex Wire & Cable Co. 103
Smoot-Holman Co. 1
Soapstone Duct Co. 28
Southern California Edison Co. ..... 2nd Cover
Southern States Equipment Corp. 15, 60
Square D Co. 13
Subox, Inc. 112

Victor Insulators Div. I-T-E Circuit Breaker Co. 45

Wadsworth Electric Mfg. Co. Inc. 22
Westinghouse Electric Corp. 4, 5, 53, 54, 88, 89, 104, 105, 110, 111

LETTERS TO THE EDITOR

Right to Work

Here are two views, both emphatic, on an important measure. To provoke thoughtful comment from our readers is an editorial aim.

To the Editor:

I have received your ELECTRICAL WEST for almost a year now. I have enjoyed it until this month. Please write both sides to that "Right to Work" on p 60, instead of the stupid side. The 16 or 18 states that have it now never had anything before and they have less now. So why should states that have everything now lower their standard of living? Unless you write the other side of the story, you can cancel my ELECTRICAL WEST.

George A. Robinson
Alderwood Manor, Wash.

To the Editor:

I was so much impressed and interested in your October issue editorial article, "The Right to Work," I am asking if reprints are available.

It is indeed regrettable that such a subject should be discussed for it is so obvious that freedom of speech, freedom to worship and all other "freedoms" granted and guaranteed to us under the Constitution make us masters of our own fate. Certainly freedom to work—when, how and where—must be one of these freedoms.

Unionism is a fine thing when its members can express their views unhampered and select their leaders of their own choice. Leaders who are honest and of character—who only have the earnest obligation to serve the members with fairness to the other side and to their country.

Certainly there are such leaders—Meany and many others—but still the Senate investigations proved clearly not all are of that kind. Men who are selfish and who through coercion force the members to do their will through any means.

The laboring man, skilled or unskilled, is in general a clean, intelligent chap and given the right to choose and think for himself, guided by leaders of honesty and integrity, there would be but few who would not want to join a union. So few in fact that whether he wanted to join or not would be of small interest to anyone. Still, that few should have their choice.

I do hope other leading publications, such as yours, will express their views. Only through ignorance, apathy or fear of reprisals can anyone take issue with this question.

George A. Boring
San Francisco

* * *

Electra's Husband—Quietly

To the Editor:

Thanks for your letter regarding my manuscript "Who Pays for Losses." I had almost forgotten about it. Sure, go ahead and print it with any changes you want to make. It will give me pleasure to be "Electra's Husband" quietly for one month.

Del Andrews
Idaho Power Co.
Boise, Idaho

Fanner Catalogs are known for their completeness of helpful information — selection tables, application data, step-by-step installation methods. The new Catalog EP-8 is more complete than ever before. You will see how FANNER's exclusive features, precision manufacturing, protective packaging and color coding work to advantage on a wide variety of applications.

Get acquainted with the products listed on the handy index tabs by sending for your copy of Fanner Catalog EP-8 today. It will prove to be of exceptional value to you!

Licensed for use under patent Nos. 2,275,019 — — other Patents Pending.

THE FANNER MANUFACTURING COMPANY
Division of Textron, Inc.
BROOKSIDE PARK • Established 1894 • CLEVELAND 9, OHIO
Telephone: SHadyside 1-6000 TWX: CV39

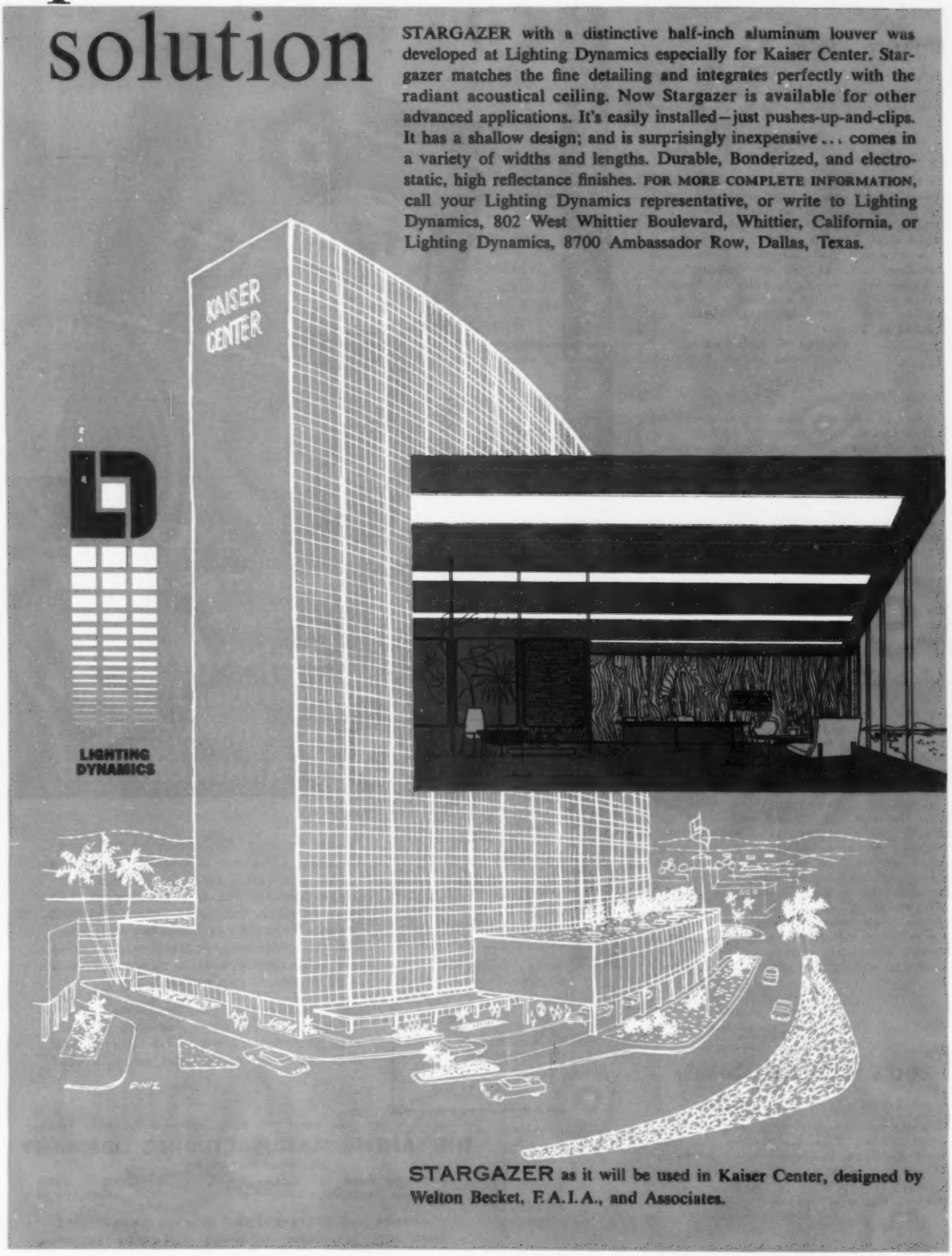
Fine Fanner Superformed Products

AGENTS and DISTRIBUTORS IN PRINCIPAL CITIES
ARMOR RODS · LINEGUARDS · TAP ARMOR · PATCH RODS · FANNGRIPS
PLASTIC FANNGUARDS · PLASTIC INSULATING TUBINGS AND MOLDINGS

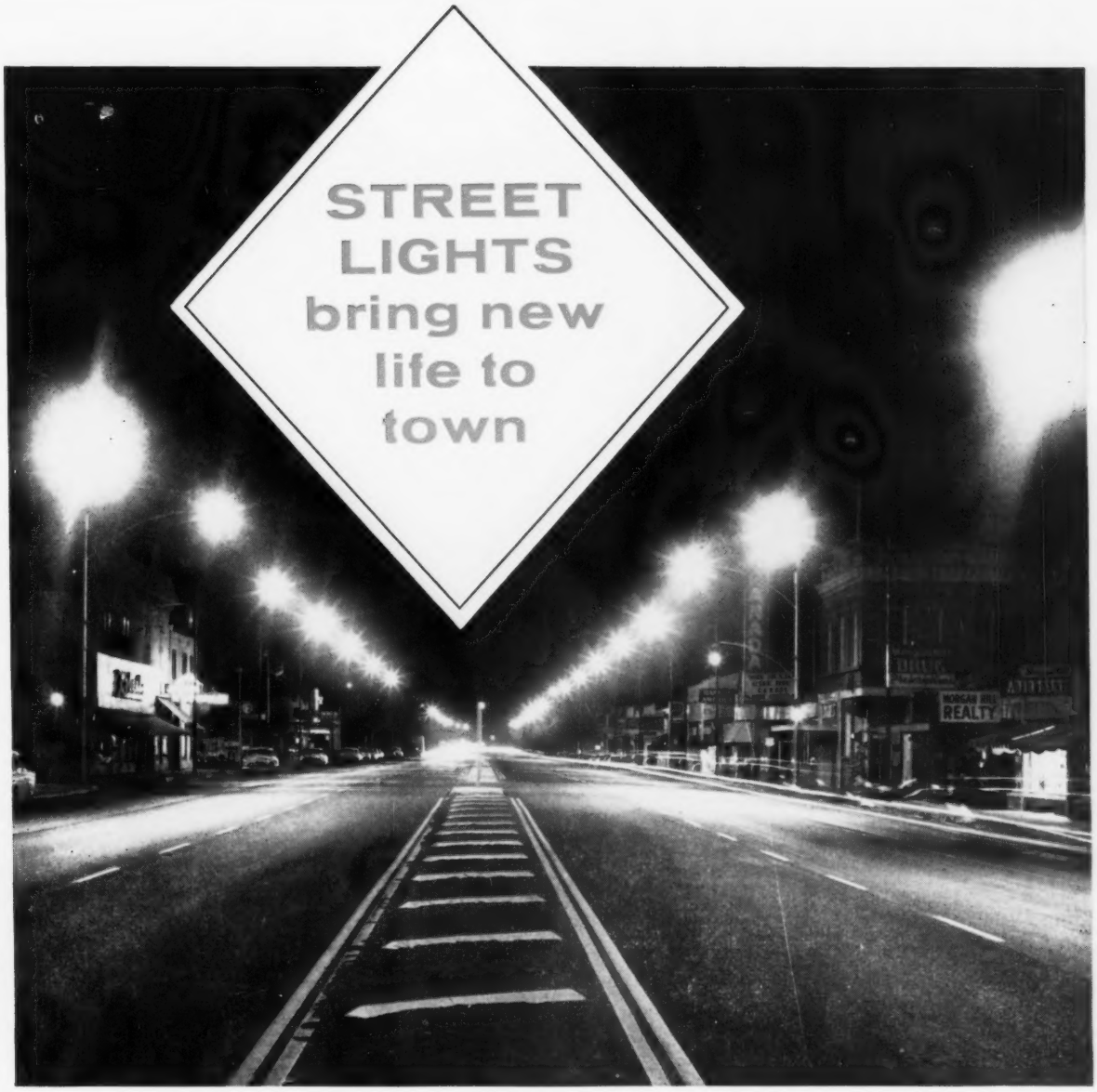
problem solution

A recessed troffer with half-inch aluminum louvers was needed for Welton Becket's striking modular lighting plan for the offices in the spectacular 28-story Kaiser Center in Oakland, California.

STARGAZER with a distinctive half-inch aluminum louver was developed at Lighting Dynamics especially for Kaiser Center. Stargazer matches the fine detailing and integrates perfectly with the radiant acoustical ceiling. Now Stargazer is available for other advanced applications. It's easily installed—just pushes-up-and-clips. It has a shallow design; and is surprisingly inexpensive . . . comes in a variety of widths and lengths. Durable, Bonderized, and electrostatic, high reflectance finishes. FOR MORE COMPLETE INFORMATION, call your Lighting Dynamics representative, or write to Lighting Dynamics, 802 West Whittier Boulevard, Whittier, California, or Lighting Dynamics, 8700 Ambassador Row, Dallas, Texas.



STARGAZER as it will be used in Kaiser Center, designed by Welton Becket, F.A.I.A., and Associates.



They're a "symbol of progress," says Morgan Hill Mayor Alfred Leonetti. And according to Hoyt Duty, President of the Chamber of Commerce, the new mercury street lamps have given main street business a real lift.

It's that way everywhere a community puts in a Master Street Lighting Plan: people step out more after dark... civic pride is bolstered . . . even real estate values have a way of rising in the light of good "municipal housekeeping."

Want to bring safer, friendlier streets and new life to your town? Ask your P.G. and E. office for the free booklet, "Modern Street Lighting for YOUR Community."

P·G and E·

Pacific Gas and Electric Company

Swot*

You don't have to be a New York Yankee to know how to swot. Nor even be a housewife with naughty children. Swot is something we all do occasionally because it means to grind away at a task.

Whether you're on the way up the business ladder or have already reached the top rung, you probably do your share of swotting — especially when it involves the problem of inadequate wiring.

But why swot? Why not do what thousands of electrical contractors, dealers, distributors and manufacturers are doing? Take full advantage of the industry's national "Live Better . . . Electrically" and "Full HOUSEPOWER" campaigns. Start merchandising these effective promotions in your advertising and sales promotion and stop swotting!

For complete details on either program, as well as other PCEA activities, drop in or write to either of our offices.

PACIFIC COAST ELECTRICAL ASSOCIATION

530 West Sixth Street, Los Angeles 14, California • 681 Market Street, San Francisco 5, California

*Swot, *v.* to sweat over a task, to grind. Webster's New Collegiate Dictionary, 1956 Edition, p. 859